NAVAL POSTGRADUATE SCHOOL

MONTEREY, CALIFORNIA

MBA PROFESSIONAL REPORT

An Analysis of Department of Defense Business Systems Modernization Efforts and Recommendations for Improving the Process

---

By: Elizabeth A. Guerra,
           Joseph E. Nicholas, and
           Corey L. Scott

December 2005

Advisors: Richard L. Dawe
               Lawrence R. Jones

THIS PAGE INTENTIONALLY LEFT BLANK

REPORT DOCUMENTATION PAGE			*Form Approved OMB No. 0704-0188*
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instruction, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188) Washington DC 20503.			
1. AGENCY USE ONLY *(Leave blank)*	**2. REPORT DATE** December 2005	**3. REPORT TYPE AND DATES COVERED** MBA Professional Report	
4. TITLE AND SUBTITLE: An Analysis of Department of Defense Business Systems Modernization Efforts and Recommendations for Improving the Process		**5. FUNDING NUMBERS**	
6. AUTHOR(S) Elizabeth A. Guerra, Joseph E. Nicholas, Corey L. Scott			
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Naval Postgraduate School Monterey, CA 93943-5000		**8. PERFORMING ORGANIZATION REPORT NUMBER**	
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES) N/A		**10. SPONSORING / MONITORING AGENCY REPORT NUMBER**	
11. SUPPLEMENTARY NOTES The views expressed in this report are those of the author(s) and do not reflect the official policy or position of the Department of Defense or the U.S. Government.			
12a. DISTRIBUTION / AVAILABILITY STATEMENT Approved for public release; distribution is unlimited.		**12b. DISTRIBUTION CODE** A	

13. ABSTRACT *(maximum 200 words)*

The Department of Defense (DOD) is in the midst of a transformation effort under the leadership of Secretary of Defense Donald Rumsfeld. A large portion of military transformation is focused on DOD business practices. It has been estimated that up to five percent of the annual DOD budget could be saved by improving and streamlining defense business operations. This initiative is critical given the large numbers of legacy business systems and the steady increases in annual maintenance costs associated with these outdated systems.

This report explores the legislative history leading to the development of the Business Management Modernization Program (BMMP). The current state of DOD business systems is examined, as well as case studies on specific system modernization initiatives conducted proceeding and immediately following the implementation of BMMP. Our recommendations for successful business systems modernization efforts include senior leadership supporting the need for change, understanding the implications of using commercial off-the-shelf (COTS) products, properly structuring the acquisition process and emphasizing the importance of systems integration.

14. SUBJECT TERMS Business Systems Modernization, Business Management Modernization Program, BMMP, Standard Procurement System, SPS, Defense Logistics Agency Business System Modernization, Defense Enterprise Accounting and Management System, DEAMS, Defense Acquisition Management Information Retrieval, DAMIR, commercial off-the-shelf, COTS, leadership, change management, transformation, legacy systems			**15. NUMBER OF PAGES** 111
			16. PRICE CODE
17. SECURITY CLASSIFICATION OF REPORT Unclassified	**18. SECURITY CLASSIFICATION OF THIS PAGE** Unclassified	**19. SECURITY CLASSIFICATION OF ABSTRACT** Unclassified	**20. LIMITATION OF ABSTRACT** UL

i

THIS PAGE INTENTIONALLY LEFT BLANK

AN ANALYSIS OF DEPARTMENT OF DEFENSE BUSINESS SYSTEMS MODERNIZATION EFFORTS AND RECOMMENDATIONS FOR IMPROVING THE PROCESS

Joseph E. Nicholas, Captain, United States Air Force
Elizabeth A. Guerra, First Lieutenant, United States Air Force
Corey L. Scott, First Lieutenant, United States Air Force

Submitted in partial fulfillment of the requirements for the degree of

MASTER OF BUSINESS ADMINISTRATION

from the

NAVAL POSTGRADUATE SCHOOL
December 2005

Authors: _____

Joseph E. Nicholas

_____

Elizabeth A. Guerra

_____

Corey L. Scott

Approved by: _____

Richard L. Dawe, Lead Advisor

_____

Lawrence R. Jones, Support Advisor

_____

Robert N. Beck, Dean
Graduate School of Business and Public Policy

THIS PAGE INTENTIONALLY LEFT BLANK

AN ANALYSIS OF DEPARTMENT OF DEFENSE BUSINESS SYSTEMS MODERNIZATION EFFORTS AND RECOMMENDATIONS FOR IMPROVING THE PROCESS

ABSTRACT

The Department of Defense (DOD) is in the midst of a transformation effort under the leadership of Secretary of Defense Donald Rumsfeld. A large portion of military transformation is focused on DOD business practices. It has been estimated that up to five percent of the annual DOD budget could be saved by improving and streamlining defense business operations. This initiative is critical given the large numbers of legacy business systems and the steady increases in annual maintenance costs associated with these outdated systems.

This report explores the legislative history leading to the development of the Business Management Modernization Program (BMMP). The current state of DOD business systems is examined, as well as case studies on specific system modernization initiatives conducted proceeding and immediately following the implementation of BMMP. Our recommendations for successful business systems modernization efforts include senior leadership supporting the need for change, understanding the implications of using commercial off-the-shelf (COTS) products, properly structuring the acquisition process, and emphasizing the importance of systems integration.

THIS PAGE INTENTIONALLY LEFT BLANK

TABLE OF CONTENTS

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF FIGURES

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF TABLES

THIS PAGE INTENTIONALLY LEFT BLANK

ACKNOWLEDGMENTS

THIS PAGE INTENTIONALLY LEFT BLANK

I. INTRODUCTION

A. PURPOSE

On September 10, 2001 Secretary Rumsfeld made the following statement:[1]

It is not, in the end, about business practices, nor is it the goal to improve figures on the bottom line. It's about the security of the United States of America. And let there be no mistake, it is a matter of life and death. Our job is defending America, and if we cannot change the way we do business then we cannot do our job well, and we must.

Secretary Rumsfeld is focused on transforming the way we do business in the Department of Defense (DOD). He estimates that successful improvements to DOD's business operations will result in an annual savings of five percent of the total DOD budget. In fiscal year 2004 (FY04), this would have equated to $22 billion in savings.[2] As a result of this focus, the Business Management Modernization Program (BMMP) was instituted. One focus of this program is modernizing business systems. DOD currently relies on approximately 4150 information technology (IT) systems to support its business functions. DOD requested $13 billion in fiscal year 2005 to operate, maintain, and modernize these systems.[3] As business systems continue to age, maintenance costs increase. As a result, future investments in the business system arena are expected to be sizeable.[4] Since the IT budgets are finite, funding must be distributed between legacy systems, modernization efforts, and acquiring new, more efficient systems.

The purpose for this research is to evaluate the status of business system modernization efforts in DOD. With the passage of recent legislative acts, DOD's ability to produce timely and accurate data necessary for effective decision making has been

---

1 Business Management Modernization Program Website. *Homepage.* Retrieved October 20, 2005 from. http://www.dod.mil/bmmp/mission_why.html

2 General Accounting Office. (2004). *Department of defense: Further action needed to establish and implement a framework for successful business transformation* (No. GAO-04-626T). Washington, DC: GAO.

3 Government Accountability Office. (2005). *DOD business transformation: Sustained leadership needed to address long-standing financial and business management problems* (No. GAO-05-723T). Washington, DC: GAO.

4 Government Accountability Office. (2004). *Information technology: DOD's acquisition policies and guidance need to incorporate additional best practices and controls* (No. GAO-04-722). Washington, DC: GAO.

brought into question. This research will examine the legislative acts dictating business systems reform and the current state of business systems within DOD. Specific cases of business systems modernization attempts will be examined in the areas of acquisition, contracting, financial management, and logistics. Testimony of the Government Accountability Office (GAO) and DOD will be examined to highlight concerns DOD has had in the area of business systems modernization. The research goal is to examine steps that have been taken to address these issues and recommend further actions necessary to achieve successful future business systems modernization efforts.

B.   RESEARCH QUESTIONS

1.   Primary Research Question

What areas can DOD focus on to further improve future business systems modernization efforts?

2.   Secondary Research Questions

- What is the current state of DOD business systems?
- What legislative acts instigated business systems reform?
- How successful has DOD been in previous business systems modernization efforts?
- What new systems have been fielded after the advent of the Business Management Modernization Program?

C.   SCOPE

This project will attempt to determine areas of improvement for business system modernization efforts. This will be accomplished through the following:

- Analyze legislative acts that were the impetus for reform
- Review Government Accountability Office perspectives on business systems modernization efforts
- Review past and current business systems modernization efforts in the areas of acquisition, contracting, financial management and logistics to evaluate areas in need for improvement and success
- Analyze past and current business systems modernization efforts to assess areas in need for further improvement

For the purposes of our research, a business system is defined in accordance with 10 U.S.C. 2222(i)(2), stating that a "defense business system means an information system, other than a national security system, operated by, for, or on behalf of the Department of Defense, including financial systems, mixed systems, financial data feeder systems, and information technology and information assurance infrastructure, used to support business activities such as acquisition, financial management, logistics, strategic planning and budgeting, installations and environment, and human resource management."[5]

Legacy systems are defined as "those systems in existence and either deployed or under development at the start of a modernization program. All legacy systems will be affected by modernization to a greater or lesser extent. Some systems will become transition systems before they are retired. Other systems will simply be retired as their functions are assumed by modernization systems. Still others will be abandoned when they become obsolete."[6]

D.   METHODOLOGY

This research is based on an extensive literature review including congressional testimonies, federal agency reports from the Government Accountability Office, Defense Department internal regulations, reports, policies and plans, journal articles, written text, and web searches. In addition, case studies from before and after the implementation of BMMP will be investigated and compared to one another in order to draw meaningful conclusions.

E.   ORGANIZATION OF THE STUDY

This research paper is organized into six chapters. Chapter II examines the legislative acts that acted as a catalyst for business systems modernization. Chapter III

---

5 Business Management Modernization Program Website. *Homepage.* Retrieved October 20, 2005 from http://www.dod.mil/bmmp/faq_certification.html

6Interoperability Clearinghouse Website. *Glossary of terms.* Retrieved October 20, 2005 from http://www.ichnet.org/glossary.htm

explains the current state of business systems and what efforts are being made to meet legislative and governmental business systems reforms. Chapter IV is comprised of case studies that analyze both past and current business systems modernization efforts. Chapter V provides insight into areas for potential improvement based on lessons learned from modernization initiatives, both preceding and immediately following the Business Management Modernization Program. Chapter VI summarizes the authors' conclusions.

II.   EVOLUTION OF BUSINESS REFORM ACTS AND PROGRAMS

A.   BACKGROUND

The United States government has a moral responsibility to its citizens to use their taxes in ways that are both fair and responsible. The financial information they use for decision making should be both timely and accurate. Despite the Federal government's best intentions, the best financial decisions are not always made, resulting in a negative impact on both the citizenry of this country and those committed to its defense.

This section will examine the many legislative acts and programs established by Congress after the passage of the Chief Financial Officers Act of 1990, more commonly referred to as the CFO Act. This act was, in our opinion, the catalyst for financial management system reform throughout the Department of Defense (DOD). As a result of the mandates set forth in the CFO Act, other laws and acts soon followed to ensure CFO Act compliance, such as the Federal Financial Management Improvement Act (FMMIA) and the Clinger-Cohen Act, both passed in 1996. The Financial Management Modernization Program (FMMP) followed in 2001 and evolved into what is now known as the Business Management Modernization Program (BMMP) in 2003. Among the many objectives these acts and laws were designed to achieve, they each had a common theme: to standardize accounting, performance planning, and the use of new information technologies.

B.   CFO ACT
1.   Background

Congress wielded its 'power of the purse' when it mandated financial management reform after several reports about fraud, waste, and abuse within the federal government. Consequently, Congress demanded better accountability of where and how appropriated funds where being spent through the use of auditable financial statements. Congress' response was to pass the Chief Financial Officers (CFO) Act of 1990. At the time of its signing, the CFO Act was the most comprehensive financial management

reform within the federal government since the passage of the Budget and Accounting Procedures Act that created both the Office of Management and Budget (OMB) and the General Accounting Office (GAO), now known as the Government Accountability Office.

According to the Comptroller General at the time, the passage of the CFO Act marked the beginning of a new era not only in federal management and accountability, but also in efforts to gain financial control of government operations.[7]

2. Overview

The CFO Act was designed to improve several aspects of financial management within the federal government. It is designed so that managers of federal agencies and those that pass appropriations laws (Congress) would have more useful information to detect early warning signs and rectify any problems before turning into a financial crisis.

The primary aspect of the CFO Act that garners the most attention is the requirement for agencies within the federal government to prepare auditable financial statements. This requirement is constantly under a microscope from GAO as well as Congress. In order to produce required financial statements, major changes to the way we manage and collect financial data had to take place. Fifteen years after the passage of the CFO Act, 18 of the 24 agencies required to submit financial statements have produced an unqualified or "clean" audit opinion. DOD has not yet produced unqualified financial statements.[8]

The CFO Act included several major changes in addition to requiring financial statements. First, the CFO Act created the office of an agency Chief Financial Officer to manage the changes mandated by the act. An agency CFO's duties include:

- Develop and maintain an integrated agency accounting and financial management system
- Develop agency financial management budgets

- Submit an annual report to the Secretary of Defense with a description of the status of agency financial management status to include financial statements and audit reports.[9]

Secondly, and the main focus of this research paper, is the CFO Act requirement to address the longstanding and serious financial management system deficiencies. The CFO Act mandates that each agency Chief Financial Officer develops financial systems that comply with applicable accounting principles, standards, and requirements. The Chief Financial Officer is also responsible for the approval and design of new financial systems to ensure their compliance with the CFO Act.

To make sure that financial systems are compliant with the CFO Act, Section 302 of the CFO Act requires that a Chief Financial Officers Council be established that consists of the Deputy Director of OMB, the Controller of Office of the Federal Financial Management of the OMB, and the Chief Financial Officers from the various agencies throughout DOD. Their purpose is to discuss issues related to the consolidation and modernization of financial systems, improve quality of information from these systems, and several other financial management matters.[10]

Even with Chief Financial Officers in each agency and a Chief Financial Officers Council, Congress felt that not enough progress was being made quickly enough. As a result, the Government Management Reform Act (GMRA) was passed four years later followed by the Federal Financial Management Improvement Act (FFMIA).

C.   THE FEDERAL FINANCIAL MANAGEMENT IMPROVEMENT ACT

A direct result of the CFO Act and GMRA was the Federal Financial Management Improvement Act (FFMIA) of 1996. This Act was passed in response to the lack of standardized, integrated financial systems mandated in earlier legislation. The objective of the FFMIA is "to promote financial management systems that comply

---

9 GAO/AFMD-12.19.4

10 Chief Financial Officers Act of 1990, 31U.S.C. 205 (1990). Retrieved August 23, 2005, from http://irm.cit.nih.gov/itmra/cfoact.html

substantially with system requirements, applicable federal accounting standards, and the U.S. Government Standard General Ledger (SGL)."[11]

The FFMIA requires that if federal agencies' systems are found to be in non-compliance with FFMIA standards in the course of an audit, the agency must submit a statement to OMB detailing what the particular agency is going to do to achieve regulatory compliance. The 'catch', in our opinion, is that many agencies are working to produce compliant data from systems that are incapable of producing the required data.

D.   THE CLINGER-COHEN ACT

The Information Technology (IT) Management Reform Act of 1996 (ITMRA) or the Clinger-Cohen Act (CCA), as it will be referred to in this and later sections, was passed in August of 1996. The Act came about due to funds being spent by individual agencies for modernizing or improving IT systems with very little noticeable progress. The CCA took control of information technology (IT) out of the hands of the General Services Administration's (GSA's) Office of Policy, Planning, and Evaluation and placed the responsibility of IT management within individual agencies. Like the CFO Act, the CCA requires that each federal agency establish a Chief Information Officer (CIO) to manage and oversee agency investments and improvements in IT.

The single most important initiative of the CCA was to ensure that agencies stopped investing in systems that worked poorly and did not improve performance or work as intended. In addition, the CCA is designed to ensure agencies take into account the fast paced nature of the IT industry and are always looking ahead.

The overall response to the CCA was positive. Organizations began to see results and agencies began to pay for IT systems that performed as designed. However, there are still many federal agencies that are unable to achieve compliance with this legislation because agency financial and business systems are unreliable and antiquated. In

---

11 Athanasaw, D. L. (Winter 1998). Financial management reform--noble intentions, audit challenges. [Electronic Version]. *The Armed Forces Comptroller, 43*(1), 18. Retrieved August 30, 2005, from the ProQuest database.

response, DOD formed the Financial Management Modernization Program (FMMP) later changed to the Business Management Modernization Program (BMMP).

E.   BUSINESS MANAGEMENT MODERNIZATION PROGRAM

1.   Overview

The Financial Management Modernization Program was established to modernize business systems and operations.[12]   This is the current effort to reduce, coordinate, and integrate DOD new business systems development. According to the BMMP website, the BMMP mission is to "transform business operations to achieve improved warfighter support while enabling financial accountability across the Department of Defense."[13] The BMMP team plans on doing this by:

- Focusing business systems modernization on acquiring capabilities that will support the warfighter

- Determining which capabilities should be common throughout DOD, and

- Controlling investments in business systems

2.   Defense Business Systems Management Committee

The FY05 National Defense Authorization Act established the Defense Business Systems Management Committee (DBSMC). The DBSMC is chaired by the Deputy Secretary of Defense and the vice chair is the Under Secretary of Defense – Acquisition, Technology and Logistics. Senior leaders from across DOD are also members. This group serves as the highest governing body and oversees all business transformation.[14] The vision and goal of DBSMC is:

> To advance the development of world-class business operations in support of the Warfighter, the Defense Business Systems Management Committee (DBSMC) is established. The DBSMC will recommend

---

12 Department of Defense. (2005). *Investment review process overview and concept of operations for investment review boards*. Washington, DC: Department of Defense.

13Business Management Modernization Program Website. *Homepage.* Retrieved August 23, 2005 from http://www.dod.mil/bmmp/index.html

14 Government Accountability Office. (2005). *Long-standing weaknesses in enterprise architecture development need to be addressed* (No. GAO-05-702). Washington, DC: GAO.

policies and procedures required to integrate DOD business systems transformation and to review and approve the defense business enterprise architecture and cross-Department, end-to-end interoperability of business systems and processes, as outlined in the attached charter.[15]

3. Business Enterprise Architecture (BEA)

The BEA is a representation of DOD's current operational and technological environment and the desired future environment.[16] The Business Enterprise Architecture is a guide for used by DOD to assist with business systems and processes transformation. The BEA links business needs to capabilities and traces strategies to systems solutions.[17] By providing one business process model DOD-wide, the BEA will achieve the following goals[18]:

- Enable business interoperability throughout DOD
- Achieve operational process excellence
- Enhance portfolio management

The BEA will be used to guide DOD in business systems investments and ensure compliance with federal mandates and requirements. According to Section 8084 of the DOD Appropriations Act, "an amount in excess of $1,000,000 may be obligated for a defense financial system improvement only if the Under Secretary of Defense (Comptroller) makes a determination regarding that improvement."[19] This will help ensure that investments in business systems are the most efficient and economical available at the time. The BEA can also be used to increase the chances that DOD

---

15 Business Management Modernization Program Website. *Homepage.* Retrieved August 30, 2005 from http://www.dod.mil/bmmp/govern_dbsmc.html

16 General Accounting Office. (2003). *Improvements to enterprise architecture development and implementation efforts needed* (No. GAO-03-458). Washington, DC: GAO.

17 Business Management Modernization Program Website. *Homepage.* Retrieved August 30, 2005 from http://www.dod.mil/bmmp

18 Tibbets, P. (2004). *BMMP Business Enterprise Architecture Version 2.2 Introduction and Walk-through* from http://www.dod.mil/comptroller/bmmp/products/bea_2-2_walk_thru/BEA2_2AMSession1Walk-Thru.pdf

19 Office of the Under Secretary of Defense for Acquisition Technology and Logistics Supply Chain Systems Transformation Website. *Portfolio management - acquistion domain policy drivers.* Retrieved August, 30, 2005 from http://www.acq.osd.mil/scst/policy_drivers.htm

investments in business systems are integrated and may also decrease the chance of noncompliant solutions being implemented because funding will be diverted from such investments.[20]

The BEA will provide visibility into finance, acquisition, materiel, and personnel. This means that there will be access to current, accurate information DOD-wide. Other capabilities that will be achieved are accountability for inventory of real property and common supplier engagement to take advantage of economies of scale.[21]

4. Core Business Missions

Five Core Business Missions (CBM) have been established to focus processes on support of the warfighter. Certification Authorities have been appointed by the Secretary of Defense for each area. The five areas (and certification authorities) are:[22]

- Human Resources Management (USD(P&R))
- Weapon Systems Lifecycle Management (USD(AT&L))
- Real Property & Installation Lifecycle Management (USD(AT&L))
- Materiel Supply & Service Management (USD(AT&L))
- Financial Management (USD(C))

The Assistant Secretary of Defense and Chief Information Officer (CIO) of DOD are responsible for information technology infrastructure and information assurance activities. All other business areas not addressed are the responsibility of the Deputy Secretary of Defense. Each Certification Authority must establish an Investment Review Board (IRB) that will provide oversight for investments in business systems. Each IRB must include representatives from combatant commands, the components, and the Joint Chiefs of Staff.[23]

---

20 General Accounting Office. (2004). *Further actions needed to establish and implement a framework for successful financial and business management transformation* (No. GAO-04-551T). Washington, DC: GAO.

21Business Management Modernization Program Website. *Homepage.* Retrieved August 30, 2005 from http://www.dod.mil/bmmp/about_priorities.html

22Business Management Modernization Program Website. *Homepage.* Retrieved August 30, 2005 from http://www.dod.mil/bmmp/about_alignment.html

23 Department of Defense. (2005). *Investment review process overview and concept of operations for investment review boards.* Washington, DC: Department of Defense.

F.   CHAPTER SUMMARY

DOD is entrusted with the responsibility of managing and spending billions of taxpayer dollars each year. With this responsibility comes scrutiny from congressional leadership as well as from within DOD. An area that has received much attention from all levels of government is the current state of business systems and their inability to produce timely, accurate, and relevant financial data. This deficiency arises from the fact that several systems and methods used to track financial data in DOD are antiquated. The congressional response to this shortfall was a landslide of legislation throughout the 1990s that was designed to improve financial management within DOD and other federal agencies.

The legislation started with the CFO Act and its demand for auditable financial statements and better accounting systems. The next major act was the Federal Financial Management Improvement Act.   This act mandates that each federal agency be accountable for their systems by reporting to DOD that they are meeting regulatory system requirements. If they are found to be in noncompliance, the agency must explain the reason behind noncompliance as well as current agency actions directed towards achieving compliance. The passage of the Clinger-Cohen Act narrowed the scope of the business reform legislation specifically to the management of information systems. This act is designed to ensure that any new financial or other business system developed achieves the goals it was designed for.

Several important changes came about from these legislative acts. For instance, the creation of the Chief Financial Officer and Chief Information Officer positions centralized responsibility and gave ownership to the individual agency for the financial data and business systems within their jurisdiction. Another change was the movement towards developing business systems cooperatively versus independently. This change has fostered an atmosphere where federal agencies have started to look beyond their own organizational business systems requirements and instead look at the problem with a macro view in hopes of developing better integrated systems.

DOD has really taken the lead in transforming its business and financial systems with the creation of the Business Management Modernization Program (BMMP). This program's mission is to, "Transform business operations to improve warfighter support while enabling financial accountability across the Department of Defense."[24] BMMP is a well designed and well intentioned program that will provide continuity among DOD business systems and financial operations. DOD took the reform one step further with the development of the Business Enterprise Architecture (BEA). BEA will link business needs to capabilities and trace strategies to systems solutions.

Although BMMP, the CFO Act, and other related financial improvement legislation have not completely solved all the financial management system problems, they have succeeded in bringing the financial reporting problems of most federal agencies, including DOD, to the attention of government leaders and decision makers. Progress will continue to be made as long as leaders throughout DOD continue to focus on the goal of improving the way we track and manage financial data. The next chapter will discuss the current state of DOD business and financial systems and what efforts DOD is taking to rectify the problem.

---

24 Business Management Modernization Program Website. *Homepage.* Retrieved November 3, 2005 from http://www.dod.mil/bmmp

THIS PAGE INTENTIONALLY LEFT BLANK

III. CURRENT STATE OF DOD BUSINESS SYSTEMS

A. INTRODUCTION/BACKGROUND

The Department of Defense (DOD) has invested several billions of dollars in financial information systems that perform many of the same functions and tasks spread across numerous DOD components. In addition, many of these systems were developed when computer and software automation were still relatively new. As a result, many systems being used today are aging and in many cases outdated. This chapter will examine the current state of DOD business systems and the efforts being made to streamline and modernize the current financial and accounting systems to ensure compliance with legislative requirements.

As a result of the Chief Financial Officers (CFO) Act and related legislation, the DOD financial management community was placed under a magnifying glass by the Government Accountability Office (GAO) and Congress to see how quickly and where they could improve their operations to meet the new standards and objectives of these laws. One area in particular that has been repeatedly scrutinized by GAO, Congress, the Secretary of Defense, and other DOD leaders is the current status of the finance and accounting systems used within DOD to track and account where and how efficiently taxpayer dollars are being spent.

As a result of the scrutiny and a perceived lack of progress being made in the area of financial management transformation, GAO placed DOD business systems modernization and financial management on its list of high-risk areas in the federal government.[25] Ten years later, financial management and business systems modernization still holds a spot on the list.

What is the current state of affairs concerning business systems? How did DOD get to the point where the organization recognized that a problem existed? These questions will be examined in the next section.

---

25 Walker, D. (2005). *Comptroller General's remarks to the senate centrist coalition.* Washington, DC: GAO. Retrieved August 5, 2005 from http://www.gao.gov/cghome/centristsenate20050201/img0.html.

B.   PROBLEM

The financial responsibility entrusted to DOD by taxpayers, Congress, etc., is immense. With annual budgets in the hundreds of billions of dollars, it is imperative that taxpayers be assured that tax dollars are being used and accounted for as efficiently and prudently as possible. The problem is that DOD business systems, finance systems in particular, are antiquated, stovepiped, redundant and not properly integrated, costing U.S. taxpayers billions of dollars annually due to these inefficiencies.[26] Consequently, several billions of dollars each year are spent on the operations and maintenance of these outdated systems and in modifications to produce better financial data and accountability.[27]

In 2005, DOD requested approximately $13 billion to operate and maintain business systems. Of this amount, only $2.6 billion or 20 percent of the information technology budget will be spent modernizing the current inventory of business and financial systems. Table 1 shows the breakdown of agency spending plans for modernization and operations and maintenance of their current business systems inventory in 2005.

Based on GAO reports and the critical press that DOD has received as a direct result of its antiquated systems, it appears that a disproportional amount of funding is spent on systems maintenance when the focus should be on the modernization or replacement of these old systems. Granted, not all the funding listed in Table 1 is designated for financial management systems, but illustrates that the longstanding problem of funding and maintaining antiquated systems is pervasive throughout the DOD.

---

26 Government Accountability Office. (2005). *DOD business systems modernization: Billions being invested without adequate oversight* (No. GAO-05-381). Washington, DC: GAO.

27 GAO-05-723T

Table 1.   Distribution of DOD's $13.3 Billion IT Budget Request for Fiscal Year 2005 for Business Systems and Related Infrastructure[28]

Dollars in Millions			
Component	Current Services	Development/Modernization	Total
Navy	$3,278	$206	$3,484
Air Force	$2,630	$726	$3,356
Army	$1,780	$607	$2,387
TRICARE Management Agency	$803	$255	$1,058
DLA	$602	$179	$781
DFAS	$407	$59	$466
Defense Information Systems Agency	$157	$34	$191
Other DOD Components	$1,074	$566	$1,640
TOTAL	**$10,731**	**$2,632**	**$13,363**

There are several documented instances where DOD has failed to meet the needs of those it serves as a direct result of its poor financial systems. The following examples help to illustrate the problems associated with the financial systems. One recent GAO study reported, "Four hundred and fifty of the 481 mobilized Army National Guard soldiers from six Special Forces and Military Police units had at least one pay problem associated with their mobilization. DOD's inability to provide timely and accurate payments to these soldiers, many of whom risked their lives in recent Iraq or Afghanistan

---

28 GAO-05-723T

missions, distracted them from their missions, imposed financial hardships on the soldiers and their families, and has had a negative impact on retention."[29]

Another GAO report found that during a 12-month period, a Special Forces soldier fell out of active duty status four times while attempting to receive medical care following a helicopter crash in Afghanistan. While not listed as active duty during the times he was dropped from the system, he was not paid and his family endured delays in receiving needed medical care. Ultimately, this particular soldier missed ten pay periods totaling $11,924.[30]

Problems like this and countless others often occur because many of the systems still require that data be manually input into the system and these legacy systems often do not communicate effectively or at all with each other. Many lines of accounting can include up to 48 digits that can be easily transposed or "fat-fingered." The GAO findings cited previously were most likely only a fraction of the service members (active duty and reserve components) that have been affected by the antiquity of financial systems used today. Efforts have been made to make data transfer easier between systems by utilizing crosswalks and data translators[31]; however, these attempts have not been completely successful and the most common result is manual data entry of required data.

Although very important, pay issues are not the only problems resulting from the antiquity of current legacy systems. Commanders and managers at all levels are not always provided with the most accurate and current financial data needed to make decisions. Due to the age of the systems and their lack of integration and standardization, data must often be moved via manual input from one system to another until it finally generates a single report in the desired format. This inefficiency alone wastes not only time and money, but also puts other DOD programs at risk when major financial decisions are made based on questionable data.

---

29 GAO-04-626T

30 GAO-05-723T

31 Specialized lines of code that enable different computer systems to communicate.

Another major problem affecting the financial systems in DOD is the sheer number of systems in use. Ironically, the number of reported business systems within DOD continues to increase, when the objective is to reduce and streamline the number of active systems. In 2002, the number of business systems reported was 1,731; in 2003 it was 2,300. In 2004, there was a slight decrease in the number of reported business systems to 2,274. The last DOD estimate in 2005 reported that there were 4,150 business systems. Of that number, 600 systems are classified as financial management systems.[32] Table 2 depicts the financial systems by component.

Table 2.   Reported DOD Business Systems by Financial Domain and Component[33]

Domain	AF	Army	Navy	DFAS	Other Defense Agencies	Multiple Owner	Not Determined	Total
Financial Management	41	88	233	93	59	15	71	600

In addition, many of the reported systems in each component perform duplicative processes. For example, the Air Force budget community uses two major budgeting systems: Micro-based Budget Automated System (MICROBAS) and Commanders Resource Information System (CRIS). Both of these systems use and produce essentially the same reports and data in slightly different formats. CRIS was billed as the future of budgeting software in the Air Force, yet they still continue to support and use MICROBAS years after it was supposed to have "gone away."

Many business and financial systems are stovepiped, meaning they have a single focus and were not designed to promote information sharing between systems. It may take multiple systems sending the same data to each other to produce a single report instead of having one system track and generate the needed results. Data must often be

---

32 GAO-05-723T

33 GAO-05-723T

transferred multiple times between systems. Information must pass through several tiers of systems to generate a single reliable output.

Another important point is the fact that the number of DOD business systems is only an estimate. Nobody is absolutely certain how many financial systems are in use throughout DOD. In addition to the number of known systems, there are most likely countless other "unknown" financial systems that have been developed at the major command level, base level organization, or other federal agencies as a work around to the duplicative nature of current financial management systems. These undocumented systems are not included in Table 1 and do not receive direct information technology funding from DOD. Often, the only funding these systems might receive is at the local level and maintenance is accomplished on service members' personal time with no direct or documented expense to DOD.

C.   LACK OF STANDARDIZATION

A major issue which is constantly documented in GAO reports, congressional hearings, service component discussions, etc., is the lack of data standardization among the many current DOD finance systems. It is important to remember that each service has developed its own systems in their own bureaucratic organizational structure.

For example, the Air Force has always focused on using the latest and greatest technology. As a service, they tend to be more receptive and adaptable to accepting and pushing for newer and more efficient ways of conducting business. The Air Force has become more corporate in its adoption of efficiency and effectiveness ideals. On the other end of the spectrum is the United States Navy, the service that is more than anything an institution. They are very sure of their independence and stature within the DOD and the United States. For this reason, they tend to hold fast to traditions and ideals. They know better than anybody else what is best for the Navy. This might explain why in Table 2 the Navy has so many more systems than the other services.[34]

---

34 Builder, C. H. (1989). *The masks of war: American military styles in strategy and analysis.* Maryland: The Johns Hopkins University Press.

This is the reason that for many years, each service acted independently and developed finance systems that helped each service to accomplish its particular mission and fit with how they identified themselves within the DOD. In the early 1980's, a major drive was made in DOD to create more of a joint focus. With the focus on joint initiatives and the increase in interactions between the services, the lack of financial system standardization and the data contained therein came to light. As a result, there is an inability for many systems across DOD to communicate effectively with each other.

Across DOD, there are numerous financial systems that perform very similar tasks. There are systems that are known by different names yet they still perform parallel tasks and generate identical reports. As a result, DOD spends countless hours generating and evaluating redundant, complex data that may or may not be useful and leads to inefficiencies and lower overall effectiveness.

A problem faced in gaining better standardization is the fact that financial management systems are intertwined with a multitude of other support systems ranging from logistics, transportation, supply, maintenance, personnel, contracting, acquisition and a host of other non-financial systems. To make broad brush standardization decisions concerning financial management systems would certainly have unintended consequences for other systems.

In response to the lack of financial system standardization, The Office of Management and Budget (OMB) issued OMB Circular A-127. This circular lays out in detail the financial system requirements that should exist within DOD and prescribes policies and standards for federal agencies to follow in developing, operating, evaluating, and reporting on financial systems.

It states that, "The federal government's financial management system policy is to establish government-wide financial systems and compatible agency systems, with standardized information and electronic data exchange between central management agency and individual operating agency systems." It also states that, "… any financial system developed should provide complete, reliable, on-time, and useful financial management data to better enable central management agencies, individual operating

agencies, divisions, bureaus and other subunits to carry out their fiduciary responsibilities. Further, the systems should be developed in such a way as to prevent and deter fraud, waste, and abuse of resources."

An important outcome of this circular is that it provides a definition of what a "financial system" is comprised of, and what it is used for. The definition of a "financial system" as defined by OMB is an information system, comprised of one or more applications, that is used for any of the following:

- collecting, processing, maintaining, transmitting, and reporting data about financial events
- supporting financial planning or budgeting activities
- accumulating and reporting cost information
- supporting the preparation of financial statements

Additionally, OMB A-127 states that each service or federal agency is required to institute and sustain *a single integrated* (emphasis added) financial management system. With a single integrated system, the plan is that the services and other federal agencies will be better prepared and able to meet the standards laid out in the objectives described above. In addition to a single integrated system, each agency must also ensure that their financial systems are reviewed regularly for compliance and that it meets all established system capabilities.[35]

D.   FEEDER SYSTEMS

The problem does not just lie with DOD financial management systems. Although, the greater part of financial systems "ownership" belongs to the Defense Finance and Accounting Service (DFAS), the majority of the data fed into their financial systems comes from feeder systems, or external systems, to DFAS. These external feeder systems originate within the four military branches of the armed forces or within other federal agencies. Several independent analyses show that upwards of 80 percent of the

---

35 Office of Management and Budget. *Circular A-12: Financial management systems*. Washington, DC: Office of Management and Budget.

data fed into DFAS accounting systems originates in non-DFAS systems.[36] As a result, the data fed from theses numerous external systems is only as dependable as the system that is feeding the information.

In the DOD report *Biennial Financial Management Improvement Plan*, DOD listed inadequate program feeder systems as one of its four roadblocks. They found that the majority of feeder systems do not integrate electronically with DFAS systems. As a result, this data must be sent by hard copy to DFAS to be manually fed into DFAS financial systems. The report also documented the fact that many of these feeder systems were created long before recent legislative acts were passed such as the Clinger-Cohen Act or the CFO Act, and have not been upgraded for compliance with these laws.

Despite receiving more than 80 percent of its data from agency systems and the military services and DFAS' lack of control over these systems, DFAS chose not to sit idly by. They have aggressively attacked the integration problem head on, although with limited success.

E.   THE DFAS RESPONSE

According to the Annual Defense Review of 2000, DFAS reported as many as 324 accounting and finance systems in 1991. In 1999, the number of systems had been reduced to 98. Of the 98 systems, 15 are finance-related systems and the remainder are accounting based systems.[37] Despite these reductions that DFAS is to be commended for, they still have issues with integration and standardization of related data.

DFAS attempted to remedy the problem with feeder systems with the creation of a data warehouse called the DFAS Corporate Database/DFAS Corporate Warehouse (DCD/DCW). It was designed to be *the* DFAS database containing all financial data.

---

36 Thomas, G. (1999). DOD's critical feeder systems: Achieving compliance with the federal financial management improvement act of 1996. [Electronic Version]. *The Armed Forces Comptroller, 44*(1), 15. Retrieved August 17, 2005, from the ProQuest database.

37 Office of the Secretary of Defense. (2000). *Annual defense review 2000*. Washington, DC: Department of Defense.

The system was designed to collect the data and then disburse it within DFAS as needed. This program was designed to be the single point of collection for all the financial data from the various feeder systems.

In order for DCD/DCW to accept data from the various feeder systems, DFAS initially chose to use crosswalks to standardize the information coming into the database.[38] This idea was abandoned after DFAS realized that the programming involved to make crosswalks for all feeder systems was unreasonably inefficient and that the costs to achieve such a goal would be prohibitive. The cost of the crosswalks was estimated at $42 million, which represented 20 percent of the $209 million development cost of the DCD/DCW system.[39]

Another concern that arises with feeder systems is that as DFAS works diligently to rectify the problem with gathering and translating data, the organizations feeding the data to DFAS are spending time and money updating their systems with little or no coordination between the two. Consequently, neither side can give any sort of guarantee that the financial systems being developed and implemented will function as a single integrated financial management system. Lack of coordination and teamwork in developing integrated software solutions only exacerbates the issue and prolongs both DFAS' and the federal agencies' ability to produce accurate and meaningful data without resulting to arcane techniques like manual data entry.

To further illustrate the point, in a DOD Inspector General Report they found that several federal agencies had multi-million dollar financial systems that could not work with DCD/DCW. For example, the Defense Logistics Agency had a $1 billion supply chain management system that could not work with DCD/DCW; both the Army and Navy could not determine if their respective financial systems could interact with

---

38 Crosswalks translate information so that systems with different formats can communicate and share information.

39 Office of the Inspector General Department of Defense. (2001). *Development of the defense finance and accounting service corporate database and other financial management systems* No. D-2002-014). Washington, DC: Department of Defense.

DCD/DCW. DFAS even suggested that the Air Force develop a program specifically for their financial management system needs with a price tag of $16 million instead of being integrated into DCD/DCW.[40]

F.   CHAPTER SUMMARY

There is a serious problem throughout DOD when it comes to the business and financial systems currently in use. Some of the problems are a lack of standardization, stovepiped systems, inefficiency due to manual data entry and redundant processes. They are also antiquated in their computer programming languages as well as in their ability to meet the needs of a twenty-first century military organization. With the passage of the legislative acts discussed in the last chapter, it has become imperative to address these longstanding problems. These legacy systems end up costing DOD millions of dollars annually to maintain. It is estimated by Defense Secretary Rumsfeld that modernizing the business and financial systems now in use could have saved DOD an estimated $22 billion in fiscal year 2004, money that could have been spent in direct support of the warfighter.

Furthermore, DOD is not exactly sure how many business systems are currently in use. The reported number of systems continues to rise even as DOD works desperately along with other federal agencies to reduce the number of systems in use. Attempts have been made by organizations such as DFAS that have been well intentioned, but were abandoned because of cost overruns and poor oversight of the programs.

At some point, the lack of coordination and seemingly endless spending with very little real progress has to stop. DOD is wasting significant resources on financial systems that appear to have left us where we started. There has been progress made but nothing significant. As a result, DOD continues to leave itself open to potential financial fraud and poor data with which major financial decisions are made. If the objective is to streamline the number of business systems in use within DOD and other federal agencies, then major changes must be made.

---

40 General Accounting Office. (2003). *DOD business systems modernization: Continued investment in key accounting systems needs to be justified* (No. GAO-03-465). Washington, DC: GAO.

THIS PAGE INTENTIONALLY LEFT BLANK

IV.   CASE STUDIES

A.   INTRODUCTION

This chapter will examine specific business systems modernization efforts from the acquisition, contracting, financial management, and logistics communities within the Department of Defense (DOD). Two of the systems examined, the Standard Procurement System (SPS) and the Defense Logistics Agency Business System Modernization, were implemented prior to the Business Management Modernization Program (BMMP). The other two systems, Defense Enterprise Accounting and Management System (DEAMS) and Defense Acquisition Management Information Retrieval (DAMIR), were implemented after the Business Management Modernization Program was employed. The case studies explore the methods used to develop and deploy the systems and analyze the problems encountered during the process. Furthermore, the case studies discuss the associated costs and savings associated with each system. Ultimately these cases will be used to develop lessons learned and will be presented in Chapter V as recommendations.

B.   STANDARD PROCUREMENT SYSTEM (SPS)

1.   Background

The Standard Procurement System (SPS) is a major acquisition program responsible for developing, testing, and deploying a software suite that automates and standardizes the procurement process throughout the entire Department of Defense (DOD).[41] The experiences and lessons learned from SPS are particularly relevant to the Business Management Modernization Program (BMMP), since SPS is the first and only DOD-wide business system ever deployed.[42]

The idea behind SPS dates back to 1994, although the impetus for SPS occurred a few years earlier. The driving forces behind SPS were the Chief Financial Officers

---

41 Standard Procurement System Website. *Program overview*. Retrieved August 9, 2005 from www.spscoe.sps.eis.army.mil/program history.htm

42 Cahlink, G. (2003). Standard procurement system. [Electronic Version]. *Government Executive, 35*(17), 76. Retrieved August 9, 2005, from the ProQuest database.

(CFO) Act of 1990 and the state of automated contract systems at that time. The CFO Act stressed the need for better accountability of total dollars spent by DOD.[43] Accountability was extremely difficult with over 70 separate contract systems lacking connectivity and standard data protocols. These legacy systems were also suffering from high maintenance costs and general obsolescence. SPS was to replace these legacy systems with one new system to be deployed throughout DOD, resulting in life cycle cost savings over the legacy systems in areas such as personnel training and process accountability.[44]

2. Methodology

SPS called for the replacement of over 70 contract-writing legacy systems. An evolutionary approach, incorporating spiral development, would be used for the program.[45] Spiral development involves the use of current technology to provide an operational system, while continually evolving and adding capabilities as advanced technology becomes available. SPS employs spiral development through the use of software versions. Each new software version or release of SPS incorporates more advanced features and offers improved capabilities for procurement personnel.

The acquisition strategy for SPS called for the use of commercial off-the-shelf (COTS) software. Acquisition reform in the mid-1990's, in the form of the Federal Acquisition Streamlining Act (FASA) of 1994 and the Federal Acquisition Reform Act (FARA) of 1996, called for greater use of commercial business practices, as well as structuring requirements to incorporate greater use of commercial goods and services. A competitive source selection took place among DynCorp and American Management Systems (AMS) in 1996. Both contractors were awarded seven month demonstration contracts prior to selection of one contractor. In April 1997, AMS was awarded a $240 million, 10-year contract for Procurement Desktop-Defense (PD2), the software package

43 Lawlor, M. (2001). Military marches toward harmonized acquisition processes. [Electronic Version]. *Signal, 55*(10), 41. Retrieved August 9, 2005, from the ProQuest database.

44 Standard Procurement System Website. *Program overview*. Retrieved August 9, 2005 from www.spscoe.sps.eis.army.mil/faq.htm

45 Lawlor

for SPS.[46] PD2 is a heavily modified version of Procurement Desktop, an existing commercial procurement software application. The use of modified COTS software would have serious ramifications for DOD later on in the contract.

Initial deployment of SPS occurred in strategically planned stages. Initial system deployment was planned for sites without large legacy systems currently in place. This helped to provide SPS with potentially higher payback and lower levels of complexity for system installation.[47] Initial installation began in 1997 with a total of 3,812 users. User totals grew to 16,000 users in 1999 and 20,894 users in 2000. Installation was originally projected for completion by October 2003, resulting in 43,000 users at 1,100 sites.[48] As of June 15, 2005, there are only 23,000 users in over 800 locations.[49]

3.   Problems/Issues

As the pioneer DOD-wide business system, SPS has had its share of problems. Deployment of the system has fallen significantly behind schedule. The original DOD estimates of three to five years for full system deployment were overly optimistic.[50] SPS was originally slated for full deployment by March 31, 2000. This schedule has continuously slipped due to software glitches, difficulty switching over from legacy systems and late software releases. Problems with fielded software were so numerous that DOD halted further development of future versions of SPS in 2002 in order to force AMS to fix the fielded version.[51] Slightly over half of the total anticipated users and approximately two thirds of the total locations employed SPS as of June 15, 2005.

Software problems have contributed to greater user resistance to SPS. Every large bureaucracy has a natural tendency to resist change. The amount of resistance is

---

46 Lawlor

47 Moore, J. (1997). AMS wins DOD-wide, $238M pact. *Federal Computer Week, 11*(10). Retrieved August 9, 2005, from http://www.fcw.com/article64655-04-13-97-Print

48 Lawlor

49 Standard Procurement System Website. *Program overview.* Retrieved August 9, 2005 from www.spscoe.sps.eis.army.mil/program history.htm

50 Moore, J. (1997). DOD inches toward $1B SPS contract. *Federal Computer Week, 11*(9). Retrieved August 9, 2005, from http://www.fcw.com/article64627-03-30-97-Print

51 Dorobek, C. J. (2002). Defense halts procurement system. [Electronic version]. *Federal Computer Week, 16*(4).

typically in direct proportion to the amount of change anticipated. This DOD-wide system change would meet substantial amounts of resistance. Many procurement professionals were used to working with automated systems specifically tailored to their Department's need, be it Army, Navy or Air Force. The new system threatened to eliminate the advantages of the custom-tailored systems currently in use and offer a replacement system that, while meeting everyone's minimum needs, performed day-to-day contracting functions less efficiently and effectively. The incremental approach taken by SPS actually increased user resistance, with many offices using slightly different software versions.[52]

The use of a modified COTS software package has also caused significant problems. Extensive modifications were made to the commercial application of Procurement Desktop. These modifications have resulted in a product costing much more than the original commercial application and caused the software to be less reliable and more vulnerable to system failures. By purchasing a modified COTS software application, DOD did not receive the rights to modify and maintain the software. The current terms and conditions of the contract do not allow DOD or another contractor to use any ideas or templates from SPS in order to design a new system.[53] This creates a long-term sole source requirement. As long as DOD intends to use SPS, AMS is the only company authorized to modify, maintain, and update the system. When the time comes for DOD to re-compete the requirement for SPS, an entirely new software system, with templates and designs distinct from the existing AMS system, must be designed, unless AMS receives the new contract award. This problem could have been avoided by adequate acquisition planning that recognized the need to negotiate additional software rights for a commercial item.

52 Lawlor

53 Verton, D. (1999). Report: Flawed acquisition strategy derails DOD's procurement system. *Federal Computer Week*. Retrieved August 9, 2005, from http://www.fcw.com/article69159-05-27-99-Print

4. System Reduction Metrics

SPS has fallen well short of the original system reduction goals it promised. SPS was originally slated to replace 76 procurement legacy systems.. The original figure for procurement legacy systems was overstated. The General Accounting Office (GAO) determined from the results of a survey conducted in 2001 that the actual number of existing legacy procurement systems was 55.[54]

Not only was the amount of existing legacy systems for procurement overstated, not all of the systems were to be replaced by SPS. Officials in the SPS program office had varying responses to the amount of systems SPS was due to replace. The number of procurement systems destined for replacement ranges between 10 and 12. One individual from the program office even made the comment that SPS was always intended to replace only 14 major procurement legacy systems.[55] See Table 3 for more detailed system status information. This information has serious ramifications on the value of SPS to DOD and will be further discussed in the cost vs. savings section of this case study.

Table 3. Status of Legacy Contracting Systems as of June 2001

Status	Number of systems
Retired as a result of SPS implementation	2
Retired for reasons other than SPS implementation	4
Will not be retired	2
Retirement dependent on implementation of a system other than SPS	2
Remaining legacy contracting systems	45
Total	**55**

Source: GAO-01-682 DOD Systems Modernization.

---

54 General Accounting Office. (2001). *DOD systems modernization: Continued investment in the standard procurement system has not been justified* (No. GAO-01-682). Washington, DC: GAO.

55 GAO-01-682

5.   GAO/DOD View on Progress

SPS has not received many positive reviews since its implementation. DOD has continued to support SPS despite a myriad of user complaints and heavy criticism from GAO. DOD still maintains the position that SPS warrants continued investment and the benefits from implementing SPS across DOD will outweigh the total cost of the system.

GAO has expressed heavy criticism of SPS. These criticisms have ranged from program management issues to system implementation procedures. GAO has raised concerns over poorly defined user requirements for SPS software, overly optimistic implementation schedules, lack of overall system expenditure tracking, and progress against initial program goals.

The most serious criticisms are the lack of total expenditure data and lack of progress checks against program goals. The SPS program office only tracks expenditures for SPS made by their office.[56] The program office does not have a mechanism to track all costs related to the system, such as user training and system operation and maintenance costs incurred at the unit level. The program office needs to know the full costs for SPS implementation and operation in order to make informed decisions on future investment.

DOD continues to support SPS despite the system falling short on key program goals. Full system implementation was originally scheduled to occur by March 31, 2000. Once this date was reached, a new milestone for system implementation date of September 30, 2003, was established. An extension of three and a half years proved insufficient. As of July 2005, full system implementation has still not occurred.

Another key goal of SPS was the use of COTS software. In order to meet DOD needs, the software had to be heavily modified, resulting in a DOD-unique system. The benefits of acquiring COTS were not realized and actually created more problems. The biggest issue concerns software data rights. If SPS had been acquired as a non-commercial item, all source code and data rights would be owned by the government. This would have allowed DOD to update, maintain, and modify the system without

---

56 GAO-01-682

reliance on the original software development company. Since SPS was purchased as a commercial item, the government does not automatically assume source code and data rights to the software. Any modifications, maintenance, and upgrades under the current contract must be made by AMS. This creates an undesirable sole source environment that the government must now deal with for SPS.

6.   Costs and Savings of System Reduction Efforts

Initial life cycle cost estimates for SPS were $2.9 billion in 1997. By 2000, this figure had increased to $3.7 billion.[57] This represents a 28 percent increase in only three years. These figures are almost meaningless due to one factor. DOD does not have a single agency responsible for accumulating the full DOD costs of SPS. DOD will always lack accurate total cost data to compare against the estimates, making the estimates useless.

Savings associated with the replacement of legacy systems have been just as nebulous. Estimated benefits in 2000 amounted to $1.4 billion. This number is probably inflated due to high number of legacy systems that were initially planned to be replaced by SPS. System replacement figures have dropped from 76 to 14. This is a significant drop in systems to be replaced. DOD cost benefit analyses have not taken this factor into consideration, since it will further hurt the case for supporting SPS.

C.   DEFENSE   LOGISTICS   AGENCY   BUSINESS   SYSTEMS   MODERNIZATION

1.   Introduction

The Defense Logistics Agency (DLA) equips our military and other civilian agencies with resources that are vital to their ability to complete their missions. They provide food, fuel, clothing, vehicles, and other consumable items to all the services and dispose of the items when they are no longer needed. DLA also assists allied nations

---

57 GAO-01-682

when necessary. There are continuous efforts within DLA to continue to streamline its supply depot and distribution systems so that items can be delivered to the warfighter when they are needed.[58]

DLA's business systems have been using 1960's technology for the last 30 years. The agency uses four major legacy systems that are not well integrated and the systems maintain separate financial and physical management information, as shown in Table 4. The systems are slow, requests take a long time to process, and users do not have access to current information. This resulted in the agency warehousing large amounts of supplies to reduce the time necessary to get the supplies, but also increasing the holding costs of inventory. The systems had no collaborative planning capabilities, so DLA was unable to synchronize its supply chain and could not cooperate with its suppliers to plan production and delivery schedules.[59] DLA customers knew that the agency took a long time to respond to their requests, so they bought supplies on their own, foregoing the cost savings received from volume discounts or long-term relationships.[60]

The systems were not well integrated, resulting in redundant functions between the field offices and headquarters, see Table 4. Much time was spent reentering information that could have been automatically entered if the systems were better integrated. Although the systems have been updated over the years, these upgrades were not able to keep up with the new technology available and the changing business practices of the organization. In short, the systems no longer meet the requirements of the agency.[61]

---

58 Global Security Website. *Defense logistics agency.* Retrieved August 26, 2005 from http://www.globalsecurity.org/military/agency/dod/dla.htm

59 Ackerman, R. K. (2004). Defense logistics modernizes commercially. [Electronic Version]. *Signal, 58*(5), 33. Retrieved September 1, 2005.

60 Greenmeier, L. (2005). Defense agency updates systems. [Electronic Version]. *InformationWeek,* (1031), 51. Retrieved August 31, 2005, from the ProQuest database. Retrieved August 26, 2005 from http://www.informationweek.com/showArticle.jhtml?articleID=159902058

61 Hooper, J. (2002). *DLA fields first release of modernized system.* Retrieved August 31, 2005 from http://www.dla.mil/public_info/read_news.asp?track=145

Table 4.   Material Management Functions Performed by Legacy Systems[62]

Materiel management function	SAMMS[a]	DISMS[b]	SPEDE[c]	DPACS[d]
Acquisition/procurement	x	x	x	x
Inventory control	x	x	x	
Requirements forecasting	x	x		
Requisition processing	x	x	x	x
Technical data maintenance	x	x		
Financial management	x	x	x	x

[a]Primary system supporting inventory management; provides information regarding stock levels, acquisition and management of wholesale consumable items, direct support for processing requisitions, generation of purchase requests, identification of items, asset visibility, and maintenance of an audit trail of transactions processed.

[b]Primary system supporting the worldwide wholesale food business in support of troop feeding and commissary resale; in supporting these commodities, performs the same functions as SAMMS.

[c]Subsystem giving DLA Supply Centers the capability to interface with vendors electronically; allows electronic transfer of requests for quotation, vendor responses, invoices, and purchase orders.

[d]Subsystem performing precontracting functions; provides purchase request management data that buyers need to complete a solicitation and award package, including item descriptions, applicable specifications/drawings, synopsis information, histories of past procurements, and other purchase requests and/or contracts open for the same National Stock Number.

Source: DLA Y2K Program Software Development Plan.

2.   Methodology – Reengineering or Reinvention

DLA has decided to replace the existing legacy systems using a phased approach to introducing new systems. They are currently attempting to replace two legacy material management systems, Standard Automated Materiel Management System (SAMMS) and Defense Integrated Subsistence Management System (DISMS) with an existing commercial off-the-shelf (COTS) Enterprise Resource Planning (ERP) system. The remaining legacy systems are scheduled to be replaced by 2007. They have established an ACAT I program to monitor the implementation.[63] Establishing a major program means that their will be more oversight and progress will be carefully monitored by GAO and other agencies. Not only are they replacing all the existing systems, but they are also reducing the number of systems that they use. In addition, the program will be web-based to allow faster, simpler access to more users.

62 General Accounting Office. (2001). *Information technology: DLA should strengthen business systems modernization architecture and investment activities* (No. GAO-01-631). Washington, DC: GAO.

63 Hooper

3. Problems/Issues

The only problems forecasted by DLA are process changes and cultural changes.[64] DLA has instituted a new program called Knowledge Transfer and Training to address the required changes. This team of individuals is responsible for developing training materials, skilled instructors, and effective delivery methods to impart the knowledge and habits necessary to make these changes. There is also an online toolkit that DLA personnel can access at any time to get advice on how to approach a situation or resolve issues.[65] DLA employees will have new processes to follow and will have to change their way of thinking to utilize the new capabilities that allow better cooperation with suppliers. They will have to think more about long term ordering instead of short term, one time orders. Once this has become the normal way of doing business, the problems associated with it should fade away. Employees will have to use the new system which has a different interface, but this will actually make training easier because it utilize a Windows-based system with a point and click interface that most people are comfortable using. While it may take a while for people who have been using the previous system for a long time to adjust, the transition should be easy since most people are familiar with that type of interface.

4. Areas of Success /Accomplishments

The first release of the new system was implemented in 2002. It was basically to demonstrate that the use of the COTS system was possible and that it can handle the requirements. The ERP system has been used for processing orders for a certain set of items and has been extremely successful.[66] Over the next few years the ERP system will incorporate all items to achieve full capability and phase out existing legacy systems. So far, DLA has experienced reduced operating costs, enhanced supply availability of the

---

64 Ackerman

65 Defense Logistics Agency. (2003). Release two design phase kicks off. *The "One DLA" Connection, 9*, September 16, 2005 . Retrieved September 16, 2005, from http://www.eitoolkit.com/tools/change_management/16_cm_comm_newsltr_dla.ppt#257,1,Slide 1

66 Hooper

items being tracked with the new system, and a reduction of the number of items on backorder.[67] The program is currently on schedule and has not had any major issues.[68]

5. GAO/DOD View on Progress

One issue that the Government Accountability Office (GAO) has had with DLA's BSM is the lack of compatibility with DOD's overarching Business Enterprise Architecture (BEA).[69] In 2001, GAO commented on the fact that DLA was managing the BSM program without an enterprise architecture. A BEA is important because, as discussed in the previous chapters, it creates the roadmap to move from the current state to the desired state of business systems. Without a plan for integrating the systems, there is little chance of successful execution, due to unforeseen issues arising and no plan of action to mitigate risk. DOD concurred with this recommendation and DLA recognized the need for an enterprise architecture and proceeded to develop and implement one.[70] Since the emergence of BMMP and the BEA, there have been complaints that the DLA architecture is not compatible with the BEA. DLA refutes this argument and claims that the architecture being used will easily fit within the overarching BEA.[71] It has yet to be seen which argument is correct as only the initial release has been implemented. Since it was a concept demonstration program, the system has not been incorporated into the overarching BEA.

GAO also commented on the fact that DLA was not investing incrementally in BSM to spread the risk over smaller programs instead of one large program.[72] GAO also

---

67 Optimal Corporation. *Case study: Defense logistics agency.* Retrieved August 26, 2005 from http://www.optimalsol.com/C-CS-DLA.html

68 Joint Interoperability Test Command Website. (2005). *JITC OT&E defense logistics agency support.* Retrieved August 30, 2005 from http://jitc.fhu.disa.mil/ot&e/dla.htm

69 Olney, D. S. (2005). Business transformation puts DLA in the know. [Electronic Version]. *Government Computer News, 24*(16). Retrieved August 26, 2005 from http://www.gcn.com/24_16/business_process_management/36216-1.html.

70 GAO-01-631

71 Olney

72 GAO-01-631

acknowledged that DLA plans to acquire and implement the new systems in an incremental manner, so this potential issue should be resolved once DLA follows its incremental plan.

6. Future Developments

The new system will ultimately track over four million items and over 30 million actions will be processed per year. This will assist managers in making decisions and managing the resources available. According to the Joint Interoperability Test Command, "BSM will support the users in all aspects of their logistics mission to include demand planning, supply planning, item cataloging, procurement, contracting, order management, and financing."[73] The current plan is to have the four major legacy systems replaced by 2007.

7. Costs and Savings of System Reduction Efforts

Cost estimates for the new DLA system range from $700M to $751M.[74] There are no other non-monetary costs projected except the process and cultural changes already mentioned. There is little data available addressing the scale of and monetary value associated with these culture changes, but DLA has taken steps, such as the training mentioned previously, to address these issues.

The projected cost savings and cost avoidance do not have monetary values associated with them that we could find, but do improve operations and will undoubtedly assist in reducing costs for DLA. First of all, the use of a Windows-based, point and click system should reduce the time needed to train personnel on the new system. This kind of interface is well known and personnel should quickly understand how to use the system. Over time this will substantially reduce the costs associated with training by reducing the time needed to conduct training in person or classroom settings. Also, the toolkit website that has been established will reduce the manpower costs associated with

---

73 Joint Interoperability Test Command Website. (2005). *JITC OT&E defense logistics agency support.* Retrieved August 30, 2005 from http://jitc.fhu.disa.mil/ot&e/dla.htm

74 Greenmeier and Optimal Corporation

training by giving people access to an online site that does not have to be constantly monitored by a human. This will reduce the salaries associated with the personnel used for training or telephone support.

This will not only reduce the training time, but will also increase the speed in which DLA can respond to customers' needs. Customers will be able to search for items online and also place orders online. The web-based system will provide automated information about each product, so customers can easily search for items that meet their needs.[75] Customers can also set up time-phased delivery of products that they forecast will be needed. This will help to improve the delivery time which will ultimately increase military readiness.[76] This should also reduce, maybe even eliminate, the number of buy-arounds being performed by individual units. Hopefully, the customers will recognize the new capabilities and speed of DLA and begin to utilize the new and improved agency. This way, DLA will be able to take advantage of volume discounts, reduce transportation costs, and track order information to use in forecasting future needs. Ultimately this should reduce the costs associated with individual units ordering their own supplies that should have been ordered through DLA.

The new system will use an open systems architecture which will allow the system to be integrated with supplier and customer systems. This way, DLA will have the ability to monitor supplier performance. The system will also have demand planning tools which will allow DLA to better forecast demand of products by tracking customer orders.[77] If DLA has a better understanding of the future needs of items, by looking at past ordering patterns, they can notify suppliers and suppliers will be able to better plan their production runs and delivery schedules. Ultimately, this will reduce the amount of inventory that needs to be carried and will reduce costs to the government. The open systems architecture also makes incorporating new technologies simpler and should reduce the risk of maintaining an ineffective legacy system.[78]

---

75 Olney

76 Ackerman

77 Ackerman

78 Optimal Corporation

Although it is difficult to associate a monetary value with the benefits listed above, it seems that the many benefits are going to reduce the costs associated with ordering and delivering the products. First of all, the training should not take as long and the use of a web-based help system should ease the burden on actual employees, ultimately reducing the salaries needed to cover training and support. Also, the ability to work with suppliers and better forecast needs will help to reduce the amount of inventory needed, which will reduce inventory holding costs. DLA will also be able to take advantage of bulk discounts and long-term supplier relationships thanks to the better forecasting and planning abilities and will save money. The ability to keep track of items and where they are located will also help to get items to the users faster. DLA can now move items from one unit that may have too many items on hand or not need them immediately and ship the items to another location that has an immediate need. Warfighters will be able to receive their supplies at the time needed and will be better prepared to perform their missions.

D. DEFENSE ENTERPRISE AND ACCOUNTING MANAGEMENT SYSTEM

1. Introduction

Financial accounting reform was what instigated the efforts within the Department of Defense (DOD) to modernize and fix the legacy systems discussed earlier in this paper. That being said, it is only fitting that we examine what efforts are currently being made inside the financial management community to improve the current state of business systems and bring them into the 21st Century. This case study will examine the Defense Enterprise Accounting and Management System (DEAMS): a financial and accounting software package designed to streamline and improve financial data flow within the DOD.

2. Background

As we touched on briefly in the introduction to this case study, it was the financial management community that initially came under fire due to its outdated accounting software. With the creation of the Business Management Modernization Program

(BMMP), the first defense-wide push was made to modernize, fix, and integrate these legacy accounting systems. As a result of this push, The Defense Enterprise Accounting and Management System or DEAMS was born. DEAMS is a joint initiative between U.S. Transportation Command (USTRANSCOM), the U.S. Air Force (USAF), and the Defense Finance and Accounting Service (DFAS). The primary purpose for the initiative was to develop an accounting system platform that hopefully will become the "solution" to the legacy accounting systems woes faced by the USAF major commands, DFAS and USTRANSCOM by integrating the functions of multiple accounting and finance software into a single software package.

DEAMS is designed to be a one-stop, completely paperless system, that when fully implemented will handle and distribute all relevant data in electronic form. The system will make use of data warehouses to control and store the flow of data. It will then support and replace a myriad of existing processes to include general ledger, budget distribution, fund control, budget execution, customer order and billing, collections, purchase requests, obligations, receipt and acceptance, accounts payable, cost accounting, analysis, and decision support.[79]

DEAMS planners have arranged for the systems to be incrementally phased into full use in three increments. The first increment (version1.1) will replace five major legacy accounting systems and incorporate data from numerous feeder systems. The major legacy systems being replaced by DEAMS are: the Air Force General Accounting and Finance System (GAFS), Integrated Accounts Payable System (IAPS), Automated Business Services System (ABSS), Airlift Services Industrial Fund Computer System (ASIFICS), and the Surface Deployment and Distribution Command's (SDDC) software package Transportation Financial Management System (TFMS-M). This increment is scheduled for release by October 2007 and will be implemented at USTRANSCOM, Air Mobility Command (AMC) and other tenant organizations located at Scott Air Force Base, Illinois, which is USTRANSCOM headquarters.

---

79 Defense Enterprise Accounting and Management System (DEAMS). (2005). DEAMS software contract awarded to oracle. *DEAMS Current Account Newsletter*(August), September 27, 2005 from http://deams.transcom.mil/files/DEAMS_8_25_05.pdf

The next phase (version 2.1) will include rolling the DEAMS package out to other USAF operational major commands as well as the Air Force Material Command (AFMC). The third and final phase is perhaps the loftiest which includes implementing DEAMS across other DOD agencies and sister services. Should this last phase occur, it will have a monumental impact on the way we collect, distribute and process financial data throughout DOD. In addition, DOD will move one step closer to achieving Chief Financial Officers Act compliance through producing clean, auditable financial statements.[80]

3. Methodology – Reengineering or Reinvention

Many attempts have been made by DOD and other federal agencies to "fix" the longstanding issues associated with the antiquity of current DOD business and financial systems. In these previous attempts, DOD has tried to reengineer legacy business systems by creating newer versions of the same systems to correct overlooked requirements or by updating them with new capabilities that make the systems more efficient. As discussed in Chapter II, many of these modernization efforts have taken place independently of one another, thus never fixing the underlying problem of integration and achieving overall efficiency.

Additionally, there is an opportunity cost to the warfighter. We need good reliable financial systems that report accurate data that can be used in making decisions that directly support our core mission as warfighters. Despite these requirements, DOD continues to spend 80 percent of appropriated funds designated for information technology on systems operations and maintenance and the remaining 20 percent on systems modernization efforts.[81] DOD can not keep pace with the increasing costs associated with legacy systems, creating a vicious cycle. As the systems get older, they require more money to maintain and as the frontline warfighter has a more active role, more funding is required to support their missions. As a result of these constantly shifting needs, the money that was designated for maintaining legacy systems instead

---

80 Defense Enterprise Accounting and Management System Website. *DEAMS 101 brief.* Retrieved August - November, 2005 from http://deams.transcom.mil/?page=faq.deams

81 GAO-05-723T

goes to support the warfighter and the money that would have been spent on modernizing business systems goes towards the operations and maintenance of the legacy systems. In the end, very little is spent fixing the problem through modernization efforts.

DEAMS is headed in a new direction for accounting and financial systems within DOD. Although attempts were made in the past to better integrate business systems with one another, the developers of DEAMS saw the clear need for a single accounting and finance system that could replace multiple finance and accounting systems in use. In addition, DEAMS will use a commercial off-the-shelf (COTS) approach to solving the problem. This will enable them to find and implement industry best practices within the DOD financial management community. For these reasons, we feel that the methodology being followed by DEAMS developers is reinvention.

4. Potential Problems/Issues

The first potential issue surrounding DEAMS is the use of COTS. Although the idea of using a COTS product for this initiative is novel, it is almost certain that a number of modifications to the original software package will have to take place to ensure that the software can perform the required budgetary accounting required within DOD. Once several modifications are made to the software, COTS advantages quickly fade as warranties become void and costs increase because of the additional support and programming required.

Another potential problem with DEAMS using COTS is total life-cycle costs. Oracle Corporation, the contractor awarded the $22.7 million firm-fixed price contract to develop the software, will most certainly have updated and new releases of the underlying COTS software in the future. If too many major modifications are requested and designed into the software by Oracle and DEAMS developers, they may end up back at square one when it comes time to upgrade the software.

To counter this issue, managers and developers on the DEAMS project team will have to make tradeoffs. They will have to decide what they can and cannot live with in the software and give up, to some degree, the amount of customization. They must consider the long term costs of upgrades and maintenance.

The second concern is the systems interfaces. According to a brief given at the American Society of Military Comptrollers Annual Professional Development Institute in 2005 concerning DEAMS, DEAMS programmers plan to use crosswalks to enable the DEAMS software to accept Air Force lines of accounting.[82] These crosswalks are very costly and labor intensive to have programmed properly. The cost prohibitive nature of crosswalks forced DFAS to abandon using them in its development of the Corporate Database/DFAS Corporate Warehouse (DCD/DCW). This is an area of concern not only due to the potential upfront costs, but also the continual stream of crosswalks that must be programmed into the software as outside federal agencies independently develop their own financial software.

DEAMS programmers will also use data warehouses to store the data that is being received by the many feeder systems. These data warehouses must be set up in such a way that they can accurately receive and interpret the data from the external systems and then be able to process and transmit the data into the DEAMS system. Another way to manage this possible problem would be for managers of DEAMS, once fully implemented, to closely govern and manage the number and types of systems that will be able to feed data into DEAMS. By getting a hold on this early and managing it from the beginning they can better integrate and manage the quality of data maintained in the system.

The third point is the perception of the program. DEAMS must avoid being viewed or perceived as the "pet project" of the month. Members in the financial management community have seen several projects/initiates that have floundered, not because they were bad programs but because they were viewed negatively. The Defense Travel System (DTS) is an excellent example. It was perceived by many as a weak system that would never work. Now that it has been implemented it is now perceived as a reliable, useful tool. It was a long and difficult challenge that is ongoing but changes were made and users accepted the program.

---

82 Senn, J. (2005). *DEAMS, A Joint USTRANSCOM, AF and DFAS Initiative Presented at the ASMC PDI 2005* from http://www.asmconline.org/development/pdi.shtml

With this in mind, it is imperative that DEAMS project leaders establish credibility among those involved in the development of the program and convince future DEAMS users that the system truly is the direction that DOD wants for the long-term.

The final issue is the cultural resistance to change found in any organization. The systems used by those in the AF and DOD financial management community have been using the same systems for decades. It is what they know and are comfortable with. It produces the results needed, albeit in convoluted and expensive ways. Regardless, people are comfortable with what they know. For DEAMS to be successful, leadership will also need to break down this cultural barrier and convince those in the financial management community that DEAMS is the future, as painful as that might be.[83]

5. Areas of Success/Accomplishments

DEAMS has had some victories since its beginning. A major accomplishment, not followed while developing other accounting and software programs, is a joint focus. Because DEAMS may become the single accounting and finance software program used across all of DOD, developers are working closely with the Army and Navy. Working closely with potential future users should help to eliminate or lessen problems and issues related to compatibility in the future.

Another area of success is the awarding of the DEAMS development contract to the software giant Oracle in June 2005. This contract was awarded as a firm-fixed price contract valued at $22.7 million. This type of contract is good for the government because it places the majority of the development risk on the contractor. This will help alleviate cost overruns that are notoriously associated with software development contracts and should help keep Oracle on schedule to complete the contract.

6. GAO/DOD View on Progress

Due to DEAMS still being in the infancy of its development, there have not been any audits conducted by the Government Accountability Office (GAO) or other federal audit agencies. Based on previous large scale information technology programs like DTS

---

83 O'Hare, S. M. (2005). *DEAMS, A project management perspective* (Term paper Winter 2005 at Naval Postgraduate School.

and the DFAS Corporate Database/DFAS Corporate Warehouse (DCD/DCW), we feel that at some point, an audit may be in order to ensure that the contract stays on track and meets all intended requirements.

DOD has been very positive in its opinions regarding DEAMS. The programmers and leaders of the program provide periodic updates to the Office of the Secretary of Defense (OSD). In addition, the program is being pursued under the blessings of the OSD via the BMMP office. Having the backing of OSD has helped to add to the credibility and cooperation among those involved in the development of DEAMS.

7. Future Developments

As the DEAMS program progresses, it will be rolled out in an incremental approach over several years. A future development that program managers may want to keep an eye on is the real possibility of newer versions of the COTS package being used. The COTS platform used to develop DEAMS today will need to be continuously upgraded. This issue and others related to COTS will be discussed later.

8. Costs and Savings of System Reduction Efforts

The initial cost of developing DEAMS is $22.7 million: the amount of the Oracle contract. There will be additional costs associated with future versions that will need to be developed, training of new employees, and rollout costs such as set up and installation..

If the ultimate goal of DEAMS becomes a reality and does become the single accounting system in DOD, it has the potential to save DOD hundreds of millions of dollars by eliminating the need to maintain outdated legacy systems. Although a very sensitive issue, there is also a potential labor savings involved with DEAMS. If DEAMS can resolve the issue of manual reentry of data currently required between some accounting systems, DOD can save money by no longer needing the labor force to maintain and input data into the current legacy systems.

9.   Summary

DEAMS is a great idea because it is a fresh way of looking at, and addressing the problem of outdated legacy systems. Instead of patching or adding to outdated systems, DEAMS is attempting to fix all the related legacy system problems by developing a single system that does it all. DEAMS holds the very real potential to be a huge success that will revolutionize the way we do accounting in DOD. It is a system that is long overdue. If successful, it will most certainly bring the finance and accounting systems into the 21st century. Time will tell whether DOD has a real winner on their hands in the DEAMS program.

E.   DEFENSE   ACQUISITION   MANAGEMENT   INFORMATION RETRIEVAL (DAMIR)

Acquisition is a critical part of DOD's operations. Developing and acquiring new weapon systems is essential for the department to fulfill its role as defender of our country. Congress, OMB, and OSD need insight into the current status of programs and future plans of each program to make crucial decisions concerning the funding, scheduling, and priorities of the various programs. Other programs could also use information on different programs to capitalize on ideas for how to address funding cuts, schedule slips, and other issues faced by program managers.

The following is the Acquisition Community Connection[84] definition of Defense Acquisition Management Information Retrieval:

> DAMIR is a DOD initiative to provide enterprise visibility to acquisition program information. The primary goal of DAMIR is to streamline acquisition management and oversight by leveraging the capabilities of a net-centric environment. DAMIR will identify the various data sources the Acquisition community uses to manage Major Defense Acquisition Programs (MDAP) and Major Automated Information Systems (MAIS) programs and provide a unified web-based interface through which to present that information. DAMIR will enable the OSD, Military Services, Congress, and other participating communities to access information

---

84 The Acquisition Community Connection is a website that unites publicly accessible knowledge communities to connect acquisition experts from government and industry.

relevant to their missions regardless of the agency or where the data resides. As DAMIR evolves, its components will replace the need for the legacy Consolidated Acquisition Reporting System (CARS). The current DAMIR capability consists of two major web-based components: Purview and the Virtual Library.[85]

The Defense Acquisition Management Information Retrieval provides a web-based interface that will present information retrieved from the various data sources in the acquisition community.[86] The first components were officially released in March 2005. One of the first steps is to identify all the existing systems that acquisition professionals currently use to manage Major Defense Acquisition Programs and Major Automated Information Systems and then provide a manner in which to present the information. This way, the various programs will have insight into other acquisition programs information, such as the Defense Acquisition Executive Summary (DAES) and Selected Acquisition Reports (SAR). Since the program is web-based, users only need to have a web browser, internet access, and an id and password.

DAMIR will eventually replace the Consolidated Acquisition Reporting System (CARS). CARS is an outdated system that requires users to reconfigure systems to load CARS and requires continuous upgrades and patches, which increases the life cycle costs of the system.[87] DAMIR will grant access to more timely and accurate information.[88] The two way information flow between the programs and OSD will help to reduce reporting requirements. The information will be stored in a net-centric database, so the data will be available to parties that have access and will do away with redundant reporting. The information will also be used by the Office of Management and Budget and Congress to help in fulfilling their oversight roles.[89] The information will be easily

85 Acquisition Community Connection Website. *Defense acquisition management information retrieval system (DAMIRS).* Retrieved September 12, 2005 from https://acc.dau.mil/simplify/ev.php?ID=76069_201&ID2=DO_TOPIC

86 Defense Acquisition Management Information Retrieval Website. *Homepage.* Retrieved September 12, 2005 from http://www.acq.osd.mil/damir/

87 Consolidated Acquisition Reporting System Website. *CARS automated system overview.* Retrieved September 12, 2005 from http://www.acq.osd.mil/cars/

88 Wright, C. (2005). Retrieval system would put procurement info on tap. *Government Computer News, 24*(17). Retrieved September 2, 2005, from http://www.gcn.com/24_17/defense-technology/36244-1.html

89 Alphabet Soup Webpage. *Homepage.* Retrieved September 12, 2005 from http://www.corpcomm-inc.com/january2005/alphasoup.htm

accessible by these groups because the information will be available on the web, so anyone with internet access, a login ID, and a password can access the information quickly and from any location.

DAMIR has just recently been released, so there is no actual data to determine if the expected benefits have actually been achieved. The ease and speed of using a web-based program seems inevitable and the access to accurate, current data will definitely assist Congress, OMB, and programs in making decisions in areas such as funding, schedule, and performance.

F.   CHAPTER SUMMARY

SPS was the first business system deployed DOD-wide. As such, the business system has had its share of problems. The program has incurred major cost overruns and numerous schedule slips. Many of these problems could have been mitigated with better acquisition planning in the early stages of the program. Requirements were not well-defined, leading to continual software add-ons, causing schedule delays and reliability problems. Extensive modifications to the COTS software package nullified many of the advantages inherent with the use of commercial items and created a sole source environment for system maintenance and upgrades. SPS has improved since its initial deployment in 1997, but many lessons on effective acquisition and implementation of business systems were learned the hard way.

DLA was able to reduce the number of its legacy systems by half with the implementation of a new ERP system. The web-based system, employing COTS software, was deployed in small increments in order to test the system with limited applications. Once the initial deployment was considered successful, later increments added more functionality, eventually replacing two legacy systems in their entirety. The ERP system helped DLA achieve better inventory management, reducing overall inventory levels and associated holding costs in the process. The system proved more responsive to customer needs, allowing DLA to achieve greater cost savings by leveraging its buying power through the use of long-term supplier relationships.

DEAMS was one of the first programs launched under the guidance of BMMP. This joint initiative between U.S. Transportation Command, the U.S. Air Force, and DFAS is designed to be an all-in-one, paperless system that will handle and distribute all relevant accounting data in electronic form. DEAMS seeks to eliminate the inefficiencies and redundancies that plague integrated legacy DOD financial accounting systems through the use of a single system utilizing COTS software. DEAMS has been successful in its initial phase of implementation. Continued success could lead to system implementation throughout DOD, significantly reducing the number of legacy systems employed for financial and accounting purposes and the steadily increasing legacy systems maintenance costs.

DAMIR is a recent DOD initiative that will provide enterprise visibility to acquisition program information. DAMIR is a web-based application that is designed to eventually replace CARS: a legacy system currently used in the acquisition community. Recently released in mid-2005, little data exists on the effectiveness of DAMIR. This system could signify the beginning of a new wave of net-centric business systems employed by DOD.

V.   ANALYSIS AND RECOMMENDATIONS

A.   INTRODUCTION

Since the genesis of business system modernization and the Business Management Modernization Program (BMMP), DOD has made great strides in advancing the way systems are modernized and implemented. Based on the case studies examined, some areas for improvement do come to light. This chapter will cover recommendations based on observations and research assembled through case study analysis. These areas are: leading change; the use of commercial off the shelf products; the importance of a structured acquisition process; and, better integration of business systems.

B.   LEADING CHANGE

Probably the biggest single factor in making any significant change in an organization is effective change management. Without it, the change initiative is likely to fail. As the Department of Defense (DOD) transforms its business systems, the need for appropriate leadership is even greater due in large part to previous attempts at financial reform that have failed. This section will discuss the need for leadership and the resistance to change that is pervasive in the culture of each military service and DOD.

1.   Why Change is Difficult in the DOD

There are several contributing factors that act as roadblocks to implementing change in DOD. The primary factors are: the parochialism of the military services, several decades of a "business-as-usual" mentality, and the lack of incentives to change.

In the book *The Masks of War, American Military Styles in Strategy and Analysis* by Carl Builder, the author presents an interesting insight into how the culture of each of the military services affects the way they lay out strategies and analysis. [90] Builder notes that the Navy is a more of an institution and, "is marked by two strong senses of itself: its

---

[90] Builder

independence and stature." He further points out that the Air Force sees itself as an "embodiment of an idea, a concept of warfare, a strategy made possible and sustained by modern technology." Last, but certainly not least, is the Army. Builder characterizes the Army as, "the essential artisans of war…forged by history and the nature of war into a mutually supportive brotherhood of guilds."

From these observations, it becomes easier to see why each service has differing cultural resistance to change. Exploring Builders observations, it appears that the Navy will change when it decides to change and no sooner. This helps to explain why the Navy has so many business systems with which they operate.

Looking at Builders observations of the Air Force, as long as it deals with better, more modern technology, the Air Force will support the idea. This helps to explain why the Air Force is one of the primary supporters and developers of the Defense Enterprise Accounting and Management System (DEAMS). Not that this will make implementing change easy for the Air Force, but the Air Force has a culture that accepts technological advances more readily than other services.

Despite the pros or cons of each service's identity they all have one thing in common; they are products of their cultures. The world renowned expert on organizational culture Edgar Schein defines organizational culture as, "The pattern of basic assumptions that a given group has invented, discovered, or developed in learning to cope with its problems of external adaptation and internal integration, and that have worked well enough to be considered valid, and, therefore to be taught to new members as the correct way to perceive, think, and feel in relation to those problems." This definition could not be more correct in defining the culture of DOD. Each respective military service and federal agency possesses ideals that have been ingrained by past experiences and traditions that make it extremely difficult for change to take place without years of patience and major changes in the way each agency views the need for change.

2. Business-as-Usual Mentality

Many of the financial systems now in use have been around for several years and been piecemealed together over time to fit the changing needs of each organization using the particular business or financial system. Users of the legacy business systems are comfortable with what they know. Users often do not want to change because they feel like the new system is not better or that it will not help make their jobs easier. They resist the change because the old way of doing business is what they know and are comfortable with. Implementing change of any magnitude forces an individual out of their comfort zone. As a result, those affected by the change initiative often "dig-in" and either passively or actively resist the change. Often people resist change because they do not see the need for change, they may fear the unknown, or they may fear losing any status or security they have developed as an "expert" under the old way of conducting business, etc.

3. Incentive to Change

The final contributing factor to why change is so difficult to implement in DOD is the lack of incentive to change. According to the General Accounting Office (GAO), the success of a DOD manager's career is based on a program moving forward and not on achieving better outcomes.[91] Based on this conclusion by GAO, it is no wonder that we have so many financial systems. As system problems were encountered, managers have a tendency to throw money at the problem or use a patchwork homegrown approach to fixing the issue to keep the program headed in the "right" direction. Program cost is not always considered a major factor as long as the job gets done and the mission progresses.

This was the case with the Standard Procurement System (SPS). Despite it falling behind schedule by five years, being a $1 billion over initial life cycle cost estimates, and not achieving its established requirements, the program continued on with full support from DOD. As of July 2005, SPS has still not been fully implemented. There has been no incentive for SPS program managers to change the way they conduct business. By

---

91 General Accounting Office. (2003). *Department of defense: Status of financial management weaknesses and progress toward reform* (No. GAO-03-931T). Washington, DC: GAO.

dragging out the length of the program, intentional or not, users of systems SPS is designed to replace are able to continue using the legacy systems.

4. **Change Theories**

Creating change in an organization is not easy or pretty. Of all the change implementation frameworks, Kurt Lewin, has the best framework for understanding how to make change happen and become permanent. His framework employs the following three phases: unfreezing the system, moving towards a new orientation and then refreezing attitudes and behaviors. Lewin's framework, in addition to John P. Kotter's *Eight-Stage Process of Creating Major Change* (see Figure 1) will be the basis for discussion on promoting change necessary for successful business systems transformation efforts.

1 Establish a Sense of Urgency
- Examine the market and competitive realities
- Identifying and discussing crisis, potential crisis, or major opportunities

2 Creating the Guiding Coalition
- Putting together a group with enough power to lead the change
- Getting the group to work together like a team

3 Developing a Vision and Strategy
- Creating a vision to help direct the change effort
- Developing strategies for achieving that vision

4 Communicating the Change Vision
- Using every vehicle possible to constantly communicate the new vision and strategies
- Having the guiding coalition role model the behavior expected of employees

5 Empowering Broad-Based Action
- Getting rid of obstacles
- Changing systems or structures that undermine the change vision
- Encourage risk taking and non traditional ideas, activities, and actions

6 Generating Short-Term Wins
- Planning for visible improvements in performance, or "wins"
- Creating those wins
- Visibly recognizing and rewarding people who made the wins possible

7 Consolidating Gains and Producing More Change
- Using increased credibility to change all systems, structures, and policies that don't fit together and don't fit the transformation vision
- Hiring, promoting, and develop people who can implement the change vision
- Reinvigorating the process with new projects, themes, and change agents

8 Anchoring New Approaches in the Culture
- Creating better performance through customer and productivity-oriented behavior, more and better leadership, and more effective management
- Articulating the connections between new behaviors and organizational success
- Developing means ensure leadership development and succession
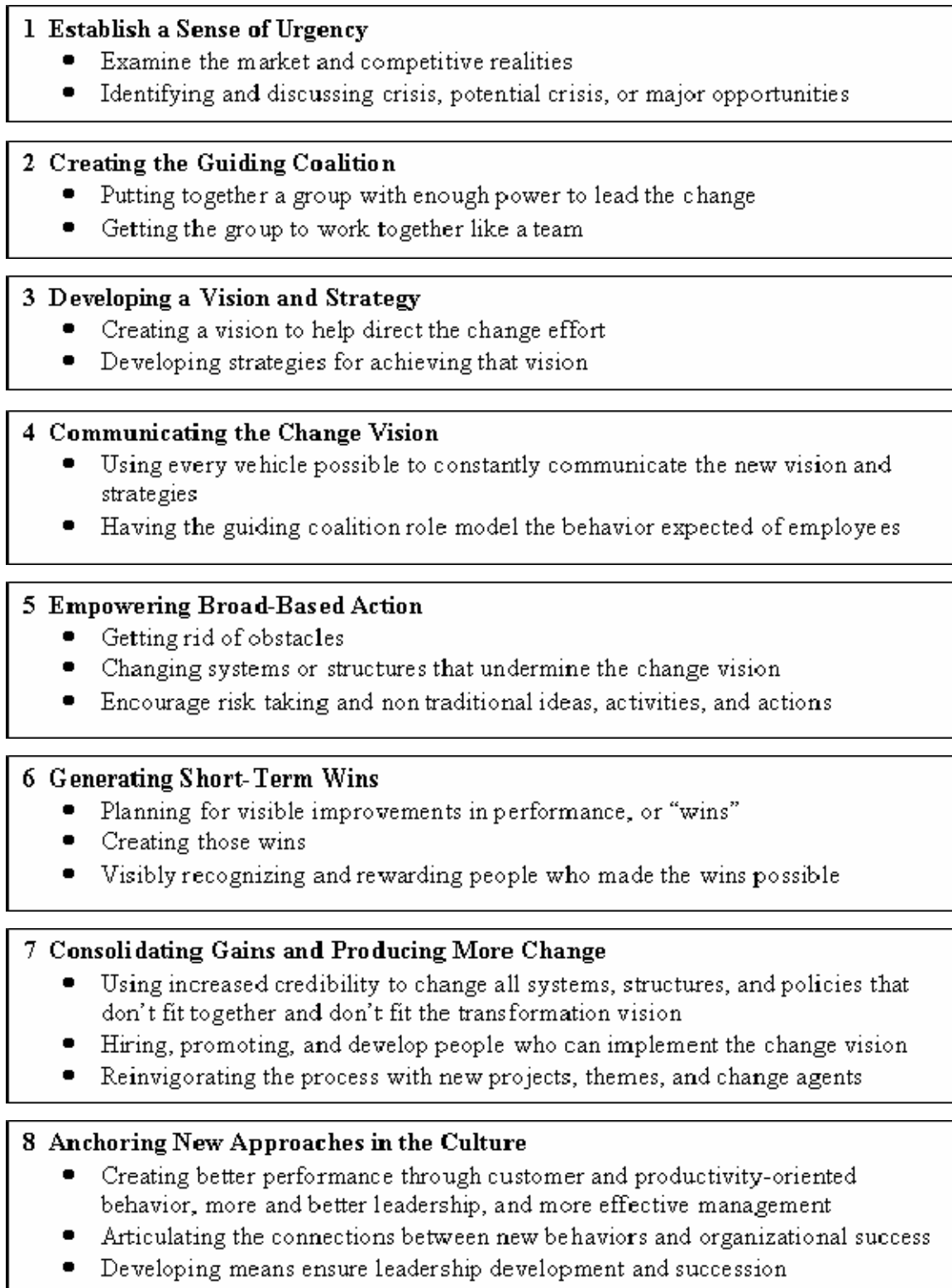
Figure 1.   The Eight-Stage Process of Creating Major Change[92]

92 Kotter, J. P. (1996). *Leading change*. Boston, Massachusetts: Harvard School Press.

5.   Unfreezing Change

How do you unfreeze a leviathan like DOD where bureaucratic methods of doing business are the norm? Using Kotter's model as a guide, the first thing is to create a sense of urgency. Those leading the change effort must create a sense of urgency that instigates people throughout the organization to adopt the change. In order for DEAMS or any other business system reform effort to be successful, all potential users must feel a sense of urgency and a need for change. In the case of SPS, there has been no clear sense of urgency. Consequently, the program is far behind schedule and has not been universally accepted by proposed users.

Another way to unfreeze change is to create a guiding coalition. Many times people are put "in charge" of a project but not given decision making authority. Other times, a management team is put together that has differing goals, ambitions, and personalities. Teams of this nature are generally their own worst enemy. They become weak, powerless, and ineffective, often heading towards certain failure. To successfully implement future business systems, or any change in DOD, strong teams must be created and not groups of individuals. These teams must have the power to unfreeze the old way of doing business and be empowered to make decisions that have enough gravitas to make a difference.

Finally, change agents must create and communicate a strategic vision for change. A vision provides focus and motivation for the program. Having a clearly communicated vision can mitigate some of the resistance to change by providing a sense of direction and assurance that change leaders know what direction they want to lead the program. More importantly, leaders of any new program must personally believe in the program and the vision. They must, as Kotter's model implies, role-model the behavior they expect from others.

The Business Management Modernization Program (BMMP) has done a very good job of making their vision public and creating a strong group of united leaders. It is

clear from the BMMP website that program leaders care about the initiative. On the BMMP homepage, they have their mission posted very prominently for each visitor of the site to see.

DEAMS and the Defense Acquisition Management Information Retrieval (DAMIR) system are both new programs and still in the infancy of their life cycles. Now is the time for leaders of both programs to get the word out concerning their vision. DEAMS leaders recently used industry meetings like the American Society of Military Comptrollers Annual Professional Development Institute (PDI) to get the word out through information booths and handouts. Both programs have done a good job so far through their individual websites, but they should also try to spread the word through DOD financial management and acquisition trade publications. The more people know about the programs, the less resistance in the long run.

6. Moving Towards a New Orientation

People like what they know and distrust what they do not know. Once you have unfrozen the old way of doing business it is imperative to get people on board with the new. Change leaders must get rid of obstacles to the change. With business systems, they must implement the new system and get rid of the system it replaced. If the old system is left in place alongside the new one, there is a very good chance that the majority of users will revert back to using the old system with which they are most comfortable.

Leaders should encourage out of the box thinking and encourage fresh ideas. As leaders listen and give credibility to others' ideas, people affected by the change gradually gain a sense of ownership and eventually pride in the system. Leaders should reward the ideas as they see these changes develop. Publicly acknowledging ideas that support the change effort will encourage others to get on board, adopt the change, and become change agents themselves.

7. Refreeze Attitudes and Behaviors

Both Lewin and Kotter point out that the final stage in creating change is to refreeze or anchor the new behaviors into the culture. This can be accomplished by continually reemphasizing and rewarding the behaviors that were prevalent during the movement to a new orientation phase. Link the successes of the organization with the change. Allow the change in behavior and culture to feed on itself. As people see the newly accepted norms, they will either accept them as their own or leave the organization. The key though is to create and groom leaders who will continue to support and encourage the new attitudes and behaviors.

8. Strong Leadership

The key to implementing and sustaining major change is to have a leader who is willing to step forward and act as a champion. The Office of Secretary of Defense - Comptroller (OSD-C) iCenter website states that a change agent must have the clout, conviction, and charisma to make things happen and keep people actively engaged in the change process.[93] In the case of former business systems modernization attempts, perhaps their failure can be partially attributed to the lack of a strong change agent. They may have had leadership in the sense of someone being "in charge," but they may have lacked the necessary personality traits of a change leader to implement a successful change.

A problem that also stands in the way of major changes in DOD is the length of tours of program leaders. In order for changes to really become ingrained, DOD needs to keep the leader in the job for longer periods of time. Currently the average length of a senior political appointee is 1.7 years and 2-3 years for government and military leaders[94]. This is too short a time to effectively implement long-term, lasting changes. The length of senior leadership tours must be extended for better continuity. Having a leader around for longer tours might also reduce the mentality of "waiting out the boss" and aid in freezing the new changes into the culture of the organization.

---

93 OSD Comptroller iCenter Website. *Change management, guiding organizations through transitions.* Retrieved October 10, 2005 from http://www.dod.mil/comptroller/icenter/learn/changeman.htm

94 GAO-03-931T

9. Summary

Long-term change cannot be cajoled or forced. It requires hard work from top management down to the lowest ranking person in the organization and everyone in between. It requires a strong change agent and long-term leadership. It requires finesse and patience, but the gains from successfully implementing major change make it worth the hard work.

C. COMMERCIAL OFF-THE-SHELF (COTS) PRODUCTS IN DOD BUSINESS SYSTEMS

All four of the case studies discussed previously in our research used COTS products and software in varying forms and amounts in their systems. But what exactly is COTS and why is it so important in current business modernization efforts pursued by DOD? Does the use of COTS products ensure program success? Is customization of COTS products a good idea? First, we will lay out the background behind the current emphasis on commercial item acquisition and COTS. Next, we will examine the common pros and cons connected with the use of COTS. Lastly, we will list and discuss seven best practices suggested for the use of COTS in DOD business systems.

1. Background on COTS in DOD

The impetus for the use of COTS dates back to the Federal Acquisition Streamlining Act (FASA) of 1994. This act requires DOD to use commercial items to the maximum extent practicable.[95] Market research must be accomplished prior to development of a new specification or soliciting for proposals to see if commercial items are available to meet the user's need. This legislation recognized the fact that the commercial marketplace had supplanted the military as the leader in technology development and implementation. As a consequence of the shift in technological leadership, DOD needed to capitalize on the opportunities now available in the commercial marketplace in order to keep pace with the changes.

---

95 United States Air Force Scientific Advisory Board. (2000). *Ensuring successful implementation of commercial items in air force systems* No. SAB-TR-99-03). Washington, DC: USAF Scientific Advisory Board.

There is an important distinction between the definition of a commercial item and the definition of commercial off-the-shelf. The commercial item definition in the Federal Acquisition Regulation (FAR) is very broad in scope. It includes products and services that have been sold, leased or licensed or offered for sale, lease, or license to the general public. The definition allows for modifications customarily available in the commercial marketplace as well as minor modifications in order to meet government requirements.[96] The FAR does not specify what are considered minor versus major modifications, giving the acquisition community a great amount of discretion on this matter.

The FAR does not define COTS. COTS products are offered to the general public; supported, maintained and continually evolved by the vendor and used without modification of internal parts.[97] The narrow definition of COTS in comparison to the commercial item definition is significant. The advantages that can be obtained by acquiring commercial items are maximized when purchasing COTS. The current definition of COTS is similar to the commercial item definition in the FAR prior to the acquisition reforms of the mid-1990's.

2. Pros/Cons of COTS

While its use is highly encouraged, COTS is not appropriate for every program and does not guarantee success. In fact, COTS can cause more problems and result in higher total ownership costs (TOC) than employing a custom solution, as seen in the Standard Procurement System case. There are benefits as well as problems associated with the use of COTS in DOD. Knowledge of these issues will enable acquisition professionals involved with future systems to determine if COTS is even appropriate for the situation. If COTS is appropriate, the acquisition community will be better equipped to capitalize on the benefits and mitigate the problems with COTS when crafting the acquisition strategies for future DOD business systems.

There are a number of significant benefits associated with COTS. The first benefit is the high reliability that comes with COTS. COTS must be highly reliable or it

---

96 Gansler, J. (2000). *Commercial item acquisition: Considerations and lessons learned, USD (AT&L) memorandum*. Washington, DC: Department of Defense.

97 Gansler

would not be successful in the commercial market. Another benefit is the faster times associated with product development than a custom system, since the commercial product is readily available. Initial purchase costs for COTS products are typically lower than custom systems. This is due to development costs for the commercial product spread over a large customer base. Vendor support services for the life of the product are an additional benefit to COTS products/software.[98]

While the potential benefits of COTS are impressive, there are some problems that can occur. One problem is that COTS products, especially software, are often released before they are ready. The rush to be the first to market is a major cause of this phenomenon. The customer is then left to fix the problems with the software themselves.[99]

Short life cycles for COTS products are another problem. The majority of DOD systems are just the opposite; they are defined by very long life cycles. This forces DOD to find ways to keep up with the changes in the commercial market, as well as have a recovery plan for products/software that vendors will no longer support. This shifts much of the leverage away from DOD and towards the commercial marketplace.

Most COTS products are incapable of providing a 100 percent solution for DOD. The real problem concerns the method chosen to reduce the gap between the COTS capabilities and the customer's requirements. The gap can be reduced by modifications to COTS products to increase or improve capabilities or adjust their business processes to fit the COTS product.

Modifying COTS products leads to a number of serious problems. Modified commercial off-the-shelf products, also known as MOTS, loose many of the advantages commonly associated with COTS products. For software products, once the software is modified, the software will no longer be compatible with the vendor's future upgrades

---

98 USAF Scientific Advisory Board

Sampson, J. Jr. (1999). *Building Dependable Systems using COTS* from http://www.crhs.uiuc.edu/FTCS-29/sampson.pdf

and releases[100]. Modifications almost guarantee the emergence of a sole source environment. Only the vendor that made the initial modifications will be able to provide system maintenance and custom upgrades. Being "locked in" to one vendor raises the system's TOC, potentially making MOTS more expensive in the long run than a custom system.

3.   Best Practices

With the potential pitfalls inherent in acquiring systems incorporating COTS products, DOD needs to develop and incorporate COTS best practices in order to gain the maximum benefits from using COTS products. These best practices will help determine the appropriate use of COTS and facilitate in the delivery of more reliable, lower total cost business systems for DOD with shorter lead times than custom systems. The seven best practices we recommend for COTS –based business systems are listed below[101]:

a.   Component modification

b.   Organization change management

c.   Configuration management

d.   Legacy systems integration planning

e.   Solicitation

f.   Vendor and product research and evaluation

g.   Tradeoff analysis

a.   *Component Modification*

Modification of COTS needs to be highly discouraged, but not prohibited. Minor modifications may be justified if it can be demonstrated that life cycle costs will not skyrocket and that the benefits outweigh the increase in total costs over the life of the system. Modifications virtually eliminate all of the benefits received from buying a

---

100 Goodenough, J., Pollak, B., & Sha, L. (2004). *Simplex architecture: Meeting the challenges of using COTS in high-reliability systems*. Pittsburgh, PA: Carnegie Mellon Software Engineering Institute.

101 GAO-04-722

commercial item. Modifying COTS in order to replicate an existing business process is not the way to benefit from the use of COTS.

b. *Organizational Change Management*

The use of COTS calls for flexible requirements from the customer. This flexibility may allow the use of a COTS product that offers an 80 percent solution to the customer's needs. The capabilities gap may be reduced by reengineering the end user's business processes to better fit the COTS product.[102] A fundamental change in mindset must accompany the shift to COTS products. When pursuing a COTS-based acquisition strategy, you are purchasing a new business process as well as the actual product.[103]

c. *Configuration Management*

Centralized configuration management is paramount with the use of COTS products. Many systems will have a multitude of COTS products that have widely varying maintenance and upgrade schedules. The rapid technology turnover that is an attribute of COTS makes centralized configuration management crucial.[104] Staying current with the latest upgrade is essential.[105] Vendors will normally support only the two most recent releases of their products. If the user does not plan for system upgrades, vendor support may not continue for the life of the system.

d. *Legacy Systems Integration Planning*

The high number of legacy business systems in DOD necessitates detailed integration planning for new COTS systems. The vendor not only must deliver a reliable working system of their own, but also must be able to link their system with existing business systems. The vendor must be able to realistically forecast the additional time and effort necessary to successfully complete this effort.[106]

---

102 Barchi, T. J. (1997). *Evaluation of best practices for developing and implementing integrated financial management system* (Special Evaluation Report No. OIG/97E-10). Washington, DC: U.S. Nuclear Regulatory Commission.

103 Carney, D., & Sledge, C. (1998). *Case study: Evaluating COTS products for DOD information systems*. Pittsburgh, PA: Carnegie Mellon Software Engineering Institute.

104 Gansler

105 USAF Scientific Advisory Board

106 GAO-04-722

e.   Solicitation

The information contained in the solicitation needs to specifically address three areas. The first area is data rights and license agreements. These areas need to be negotiated up front in order to avoid costly mistakes following contract award.[107]   The next area concerns evaluation factors. The solicitation should state that the vendor should have valid prior experience employing COTS-based solutions.[108]   Most importantly, use TOC as one of the source selection criterion. Vendors will then focus on the total life cycle cost of the system, not simply the initial purchase cost.

f.   Vendor and Product Research and Evaluation

COTS products require a high level of market and product research in order to find the best fit.   One area of research involves the financial health and short/long-term strategies of vendors within a particular market. This mitigates the risk of selecting a vendor that may go out of business, leaving the system without support. Another research area concerns the duration of product support the vendor is willing to provide.[109] This could affect the vendor selected, depending on the expected life span of the product.

g.   Tradeoff Analysis

Users must understand the tradeoffs present with COTS products. Typically, initial system cost is much lower than a custom system. The user must remember to factor in the support, maintenance and upgrade costs inherent when acquiring COTS-based systems. The customer must be able to accurately budget for the system over the entire life cycle of the system. Total ownership costs must be thoroughly analyzed prior to making the decision to use COTS products.

---

107 Gansler

108 USAF Scientific Advisory Board

109 Carney, D., & Oberndorf, P. *The commandments of COTS: Still in search of the promised land.* Pittsburgh, PA: Carnegie Mellon Software Engineering Institute.

D.   STRUCTURED ACQUISITION PROCESS

1.   Required Management Framework

According to the Government Accountability Office, "the way in which DOD has historically acquired information technology (IT) systems has been cited as the root cause of these systems failing to deliver promised capabilities and benefits on time and within budget."[110]   One of the best practices for business systems acquisition is acquisition planning of the entire acquisition process.[111]   DOD has a management framework that addresses this practice, but there are no policies that ensure programs are properly applying this best practice.[112]   DOD requires the use of the management framework as described in DODI 5000.2[113] for all acquisition programs. An acquisition program is any "directed, funded effort that provides a new, improved, or continuing material, weapon or information system, or service capability."[114]   Therefore, the guidance applies to business systems as a subset of information systems. The purpose of DODI 5000.2 is to establish "a simplified and flexible management framework for translating mission needs and technology opportunities, based on approved mission needs and requirements, into stable, affordable, and well-managed acquisition programs that include weapon systems and automated information systems (AIS)."[115]

---

110 GAO-04-722

111 GAO-04-722

112 GAO-04-722

113 Defense Acquisition Guidebook Website. (2003). *Operation of the defense acquisition system* (No. DODI 5000.2). Retrieved October 20, 2005 from http://akss.dau.mil/dag/DoD5000.asp?view=document&doc=2
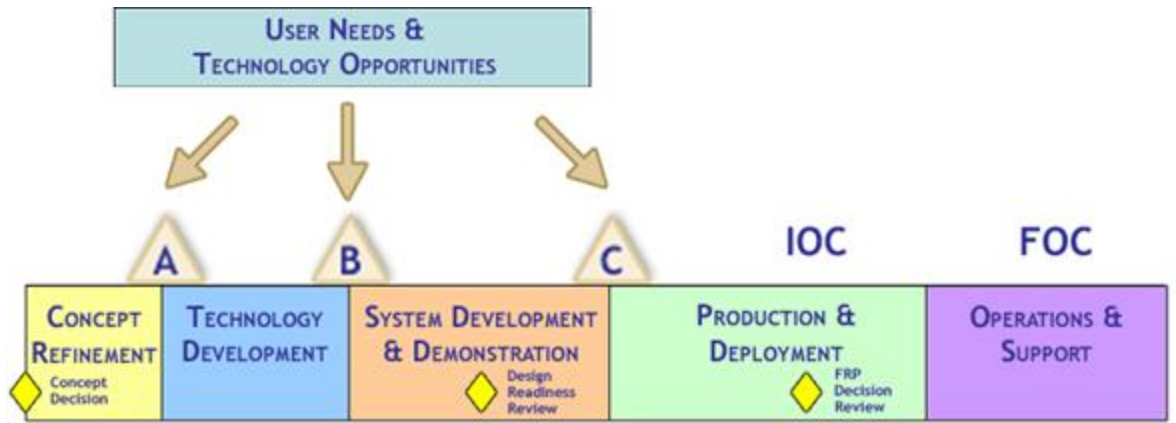
114 GAO-04-722

115 DODI 5000.2

Figure 2.   DOD Management Framework (From DODI 5000.2 p2)

2.   Previous Issues

The process must begin with good, well-defined requirements. This has been an issue in the past. For example, the case study performed on the Standard Procurement System (SPS) uncovered some issues in the requirements generation area. As noted in the case, personnel were not even sure which systems SPS was supposed to replace. It is difficult to procure a system that will have the correct capabilities when the required capabilities are unclear.

The framework allows for systems to enter at Milestone A, B, or C depending on the maturity of the technology being used. Since many business systems are commercial off-the-shelf (COTS) items, many enter at Milestone C. Concept Refinement is the period of time used for refining the initial concept and determining if an evolutionary approach is appropriate for the acquisition.[116] Evolutionary acquisition is the preferred DOD strategy when appropriate. The program should balance needs and available capability with the resources available to provide a useful capability to the user as quickly as possible.[117]

---

[116] Evolutionary acquisition is an acquisition strategy that allows increments of useful capability to be fielded to the user more quickly than a typical acquisition strategy that provides the full capability, but takes longer to develop. More information is available in the Memorandum from Secretary Aldridge, April 12, 2002.

[117] DODI 5000.2

Technology Development is the stage when user requirements are refined and the appropriate technologies that will be integrated into the system are determined. For business area capabilities, commercially available solutions will be employed whenever appropriate and Automated Information Systems (AIS), which are often used as business systems, shall answer the following questions affirmatively:[118]

- Does the acquisition support core/priority mission functions that need to be performed by the Federal Government?

- Does the acquisition need to be undertaken by the DOD Component because no alternative private sector or governmental source can better support the function?

- Does the acquisition support work processes that have been simplified or otherwise redesigned to reduce costs, improve effectiveness, and make maximum use of commercial off-the-shelf technology?

System Development and Demonstration is entered once the system has mature technology, approved requirements, and funding. During this stage the system, or increment if using evolutionary acquisition, is integrated and the capability is demonstrated in its intended environment. For business systems, this may include handling a subset of the data the system should track or store.

Production and Deployment involves operational test and evaluation to determine the operational suitability of the system. Software must demonstrate the appropriate maturity level. This is another area where SPS did not completely follow the appropriate planning. The system was not tested in the appropriate environment. Although an evolutionary strategy was employed, the users were resistant to the change and software problems were not worked out before handing off to the users. This created more problems (resistance to change)[119] because the users were unhappy with the system since it did not provide them with a useful capability.

The Operations and Support phase is usually the longest phase in the life cycle of a system. This is when a support program should be executed that meets the needs of the

---

118 DODI 5000.2

119 This is further addressed in the Standard Procurement System case study in Chapter IV and some ways for leadership to address this issue is in the Leadership portion of this chapter.

user and sustains the system in the most cost effective manner. For business systems this phase will include upgrades to the system, incorporating new technologies as they become available, and training. This phase should be considered during the earlier phases to avoid issues and unforeseen sustainment issues. If using an evolutionary acquisition strategy, plans should be made to replace or modify previously fielded versions of the system with the latest increment.

The final stage is Disposal. This refers to eliminating the system from use. This is fairly simple and requires removing the software from computers or disposing of program specific computers.

Throughout the system's life cycle, investment decisions should be based on tradeoffs between capabilities available, requirements of the system, cost and schedule restraints, and the architectural environment the system must operate in. Any changes that are incorporated must be passed on to the user, as they will affect how the system is used.[120]

3. Steps Already Taken to Improve the Process

The Business Management Modernization Program (BMMP) has already started to address some of the issues seen in the past while procuring business systems. The Investment Review Board (IRB) has been established to provide oversight and review of business systems modernization efforts that exceed $1 million. The program will be reviewed and approval will be through the IRB. The IRB will "assess modernization investments relative to their impact on end-to-end business process improvements supporting warfighter needs."[121] Then the Defense Business Systems Management Committee (DBSMC) is responsible for approving investment decisions and continually monitoring schedule and milestone completeness, costs and resources, performance

---

120 GAO-04-722

121 Business Management Modernization Program Website. *Homepage.* Retrieved October 18, 2005 from http://www.dod.mil/bmmp/manage_entities.html

metrics, and risks.[122] This oversight will provide incentive for programs to follow the required management framework and deliver useful business systems to the users.

4. Recommended Further Actions

BMMP has made a good start on ensuring that efficient, effective business systems are delivered to the users. Since good requirements assist in making the framework effective, it will be beneficial for BMMP to inspect requirements and make sure the programs develop and refine the requirements to deliver the necessary capabilities. This will assist in following the framework, since good requirements are the foundation for sticking to the schedule associated with the management framework. The following is a list of guidelines to follow when generating requirements:[123]

- Keep users involved

- Develop and refine requirements

- Define and use consistent terminology, organize requirements, monitor/track development and changes, document all requirements and changes and why they changed

- Make requirements management a repeatable process

- Match resources available and requirements

The most important of these is user involvement. Having a knowledgeable person who has used the existing system, knows the processes currently used, and can help prioritize requirements will result in requirements that meet the needs of those who will be using the system on a daily basis. As previously mentioned in the SPS case study, this was not done and has resulted in an ineffective system that users were reluctant to accommodate. If those who implemented SPS had, at the very least, gotten some input from personnel who would be using the system, there would have been some buy-in on the user side. This could have helped to decrease the resistance to change from the users' side and even if the system was not the 100 percent solution, users may have been more willing to try to make the system work. With the implementation of BMMP, steps are

---

122 Business Management Modernization Program Website. *Homepage.* Retrieved October 18, 2005 from http://www.dod.mil/bmmp/manage_entities.html

123 Turk, W. (2005). Mission Possible…With good requirements. *Defense AT&L, XXXIV*(5), 20. and General Accounting Office. (2001). *Better matching of needs and resources will lead to better weapon system outcomes* (No. GAO-01-288). Washington, DC: GAO.

already being taken to better involve users. DEAMS is one example where DOD has considered user involvement. Even though the system is currently being released to the Air Force, they are working with potential future users (Navy and Army) to ensure the needs of all services and organizations are met.

Developing and refining requirements is also important. Once the requirements are defined, it is necessary to refine these throughout the acquisition process, specifically in the technology development phase if not using COTS technology. If a system does not perform as needed or additional information is gathered resulting in new/different requirements, the requirements should be updated and the system should be updated. Upgrades and improvements should be planned into the requirements, especially for software systems. With technology constantly changing, requirements should include ways to incorporate improvements. This way, systems can stay up to date without having to develop or purchase entirely new systems.

One way to do this would be to plan to use an evolutionary acquisition process or at least schedule preplanned product improvements. Throughout the life cycle of the system, requirements will be revisited and improvements will be made. New technologies can be examined and either added to the existing system or replace portions of the system currently being used. In the case of the Defense Logistics Agency (DLA), this worked very well. Instead of simply throwing the system out to the user, small increments were used for specific products to ensure that the system could handle the entire inventory it was supposed to track. This left multiple systems running for a while and users had to be comfortable with both, but ultimately resulted in a system that met all the needs. If it hadn't worked, it would have been fairly simple to move the few items that were being tracked in the new system back to the old system. Therefore, the users of the DLA system did not have all of their eggs in one basket and could be sure that the new system would work properly before inputting all their data into the system. DEAMS is also using a similar method for introducing the system through three increments.

Defining and using consistent terminology, organizing requirements, monitoring and tracking development and changes, documenting all requirements and changes, and why they changed are just good management rules that should be incorporated into most

projects. Having well-defined terminology will reduce the confusion between the buying office, the user, and the producer of the system. This way all stakeholders will be on the same page and should understand the requirements of the system. Without a common terminology, it is difficult to deliver a system that meets the needs. All changes to requirements should be monitored and documented so that the cause for the changes can be examined. Changes often lead to an increase in cost and schedule, so a good rationale should be documented. Also, this will assist any newcomers to the process, by bringing them up to speed more quickly and it will avoid rehashing resolved issues.

Making requirements generation a repeatable process is also important, especially since the BMMP office will be responsible for overseeing the procurement of business systems over $1 million. There should be a process that can be passed to organizations that will help them to develop good requirements, which will ultimately result in better systems for the users. The process should address how to monitor and handle changes because technologies and capabilities are constantly changing in the software environment. The BMMP office will also have a better understanding of what the organizations need and why they need it. This will help the BMMP office determine how systems being acquired will affect and fit into the Business Enterprise Architecture.[124]

Matching available resources and requirements is mainly a leadership issue.[125] It is important to plan for funding to match the systems that are needed. Right now organizations can procure systems without BMMP oversight if they are under $1 million threshold. This may cause organizations to purposely underestimate the cost of the new system. This may result in a cost overrun or not receiving a system that has all the necessary capabilities. In the long run, it will cost more to make changes to the system or buy another system that actually performs the intended job. Tradeoffs will have to be made at some point and it is beneficial to the organization procuring the system to have an accurate estimate of the cost and the funding available for the new system. It is also important to carefully plan what resources will be available for training and upgrades.

---

124 The Business Enterprise Architecture is described in Chapter II.

125 General Accounting Office. (2001). *Better matching of needs and resources will lead to better weapon system outcomes* (No. GAO-01-288). Washington, DC: GAO.

The constantly changing software environment requires that upgrades and training be included in the acquisition strategy. This requires funding and should be considered by the leadership of the organization.

5. Summary

Requirements are one of the most important aspects of procuring new business systems. A good understanding of the necessary capabilities and features needed in the new business system will help to assure that the system purchased will perform the necessary mission. Involving skilled users will help to refine the requirements and will create an atmosphere in which personnel will be more willing to work with the new system because they will have more buy in. A solid, repeatable requirements process is the key and the BMMP office should be responsible for developing and passing on this process. Making sure the resources and requirements are matched will result in better cost estimates. Ultimately, developing good requirements will lead to better implementation of the prescribed management framework.

E. INTEGRATION

1. Importance/Benefits Realized from Integration

All the activities of DOD are closely related. Each organization requires information from others to perform its mission more efficiently and effectively. For example, in the logistics domain it is important to have accurate information regarding location of existing assets, lead time to deliver materiel to locations, and the financial status of the organization. This information will make it easier for decision makers to determine the quickest and most cost effective way to purchase and distribute resources. Additionally, they will be better able to forecast needs and be able to take better advantage of economies of scale when purchasing items.

In the financial and acquisition arenas, decision makers require access to accurate data concerning the status of programs in order to better allocate scarce resources to programs based on their historical progress and necessity to DOD. Additionally, they need to comply with federal laws and regulations by delivering a clean audit statement. DOD utilizes many different business systems to capture the data needed by decision

makers. In order to permit decision makers to view the necessary information, it would be beneficial for the systems to be integrated and provide users with access to timely, accurate, and reliable information. This way many users will have access to the same information.

2.   Past Integration Issues

In the past, organizations would develop business systems that were focused on the specific mission of that organization without considering the consequences of not integrating with other systems. This is true not only across the various components, but also within the components. One example of the problems caused by not integrating is demonstrated by the inventory systems of DOD. At one time there were over 200 systems that were not integrated, so there were multiple data entry points. This caused data to be entered improperly and the data could not be reconciled, so there was no way to determine the actual inventory.[126] Another example is tracking information technology (IT) investments. The Business Management and Systems Integration[127] (BMSI) office could not even determine the actual number of existing business systems because their three databases were not integrated.[128]

The stovepiped nature of previous system developments may have helped to optimize the subprocess that the system was built for, but it ultimately impairs the overall business of DOD.[129] Data that was needed for other systems would have to be reentered manually into multiple systems, which results in erroneous information due to the probability of inducing errors. This also increases the amount of time other organizations have to wait to get the information.[130]

---

[126] Government Accountability Office. (2004). *DOD business systems modernization: Billions continue to be invested with inadequate management oversight and accountability* (No. GAO-04-615). Washington, DC: GAO.

[127] BMSI is the program management office established by the Under Secretary of Defense to oversee and manage the Business Management Modernization Program.

[128] GAO-04-615

[129] Business Management Modernization Program Website. *Homepage.* Retrieved October 20, 2005 from http://www.dod.mil/bmmp/mission_improvement

[130] GAO-04-615

Systems that are not integrated lead to errors that may be critical to the completion of DOD's mission. In order to deliver the best weapon systems and materiel to warfighters in a timely and cost effective manner, decision makers need accurate and current information. Since the push for a more joint environment, integration has become even more crucial to DOD.

3. BMMP Actions Taken to Address Integration Issues

The Business Management Modernization Program (BMMP) has already taken steps to better integrate existing and new business systems. The Business Enterprise Architecture (BEA)[131] has been designed to focus on instituting an "integrated, realistic, and actionable" framework that "builds interoperability across DOD."[132] The BEA defines business capabilities, rules, data standards, and operating requirements that are intended to improve the ability to deliver capabilities and resources to the warfighter.

The priorities of BMMP also warrant a more integrated business systems environment. One priority is financial visibility. This means providing decision makers with accurate financial information as soon as possible. One way BMMP plans to do this is by creating and implementing a common financial language across DOD.[133] A common language will assist in integrating business systems by reducing the need for software to translate different words or symbols into other words or symbols specific to a different business system. This will ultimately result in an increase in the speed and accuracy of financial reporting and will enable decision makers to better and more quickly allocate resources.

Another priority of BMMP is common supplier engagement. One of the objectives to achieve this goal is the development of interoperable systems across DOD. This will require standard business processes, rules, and data. In addition, BMMP plans

---

131 The BEA is a blueprint to guide and constrain investments in DOD's organization, operations and systems as they relate to or impact business operations. More information is available in Chapter II.

132 Business Management Modernization Program Website. *Homepage.* Retrieved October 20, 2005 from http://www.dod.mil/bmmp/faq_bea.html

133 Business Management Modernization Program Website. *Homepage.* Retrieved October 20, 2005 from http://www.dod.mil/bmmp/priorites_financial.html

to use standard data to transform internal interfaces.[134] Using standard data will ease systems integration by making it simpler to transfer data from one to another.

One final priority of BMMP that requires systems to be better integrated is materiel visibility. DOD wants to be able to track materiel throughout its life cycle and provide transaction visibility across logistics systems. The result will improve readiness by providing real time information on the location and status of equipment. Materiel visibility will lead to optimal deployment of materiel whenever and wherever it is needed in the most cost effective manner.[135]

The case of the Defense Acquisition Management Information Retrieval (DAMIR) system is one example where DOD has decided to make the program web-based to provide access to multiple users at a time. This allows multiple people to access program information and use this to make faster, more informed decisions concerning funding, scheduling, and other issues.

4.   Further Actions Needed

A paradox exists for DOD between the size and complexity of the organization and the flexibility needed to perform the mission. This means that DOD is an extremely large and complex organization, but needs the flexibility to change focus at any time. This requires that accurate, immediate information be available for decision makers. An integrated network of business systems will assist leadership by providing the necessary information. DOD has recognized that creating individual links between entities is not the best approach for an organization as large and complex as DOD.[136] That is why BMMP plans to improve integration by enhancing the net-centricity of future versions of the BEA.[137]

---

134 Business Management Modernization Program Website. *Homepage.* Retrieved October 20, 2005 from http://www.dod.mil/bmmp/priorities_common-supplier.html

135 Business Management Modernization Program Website. *Homepage.* Retrieved October 20, 2005 from http://www.dod.mil/bmmp/priorities_materiel.html

136 Walker, R. L. (2002). DOD expects industry to help it achieve net-centricity. *Government Computer News, 21*(29). Retrieved October 25, 2005, from http://www.gcn.com/21_29/news/20098-1.html

137 Business Management Modernization Program Website. *Homepage.* Retrieved October 20, 2005 from http://www.dod.mil/bmmp/faq_bea.html

Net-centricity is a global, web-based environment that allows for cross functional information exchange. It will provide users with access to applications, services and data that is understandable and assists in the decision making process.[138] The department has been broken into five Core Business Missions (CBMs) that "integrate horizontally across all functional areas (e.g., planning, budgeting, information technology (IT), procurement, maintenance, etc.) to provide end-to-end warfighter support."[139] The CBMs are human resource management, weapon system lifecycle management, materiel supply and service management, real property and installations life cycle management, and financial management. Each of the components will be responsible for integrating the CBMs by introducing net-centricity and populating the network with data.[140]

This new approach to handling data is intended to improve situational awareness, provide access to better business information, and shorten decision cycles by securely connecting people and systems regardless of time or location without the use of predefined interfaces between individual systems.[141]

Although this is a great idea, there are still some concerns that exist. While there are some technical[142] matters that need to be addressed, the two main areas that need to be dealt with relate to culture and security. One of the most crucial elements of net-centricity is the data that is input by users. There have been cultural barriers in the past

---

138 Horizontal Fusion Website. *About net-centricity.* Retrieved October 14, 2005 from http://horizontalfusion.dtic.mil/about/net-c.html

139 Business Management Modernization Program Website. *Homepage.* Retrieved October 24, 2005 from http://www.defenselink.mil/bmmp/mission_unify.html

140 Business Management Modernization Program Website. *Homepage.* Retrieved October 24, 2005 from http://www.defenselink.mil/bmmp/mission_alignment.html

141 Department of Defense Chief Information Officer. (2003). *Department of defense net-centric data strategy.* Washington, DC: Department of Defense. Retrieved October 20, 2005 from http://www.defenselink.mil/nii/org/cio/doc/Net-Centric-Data-Strategy-2003-05-092.pdf

142 The technical software and connectivity details of instituting net-centricity are outside the scope of this project.

that still exist today, causing people to not share valuable information.[143]   The Chief Information Officer plans on instituting the following mitigation measures to reduce the resistance to data sharing[144]:

- Use awareness campaigns and incentives

- Ensure organizational and leadership awareness of net-centricity, data posting, and sharing

- Commit to data posting and sharing by incorporating approaches to processes and procedures

The unique security concerns of DOD also pose some issues for implementing a net-centric environment.[145]   If certain information ended up in the wrong hands, it could be detrimental to DOD conducting its business. The Chief Information Officer plans to implement security structures that make data visible and accessible to the appropriate users by:[146]

- Coordinating with Information Assurance activities

- Ensuring inclusion of security classification for data

- Providing a strong management infrastructure that identifies users to enforce security, roles, accesses, author identification, and audit trails

Another area of concern is the quality and accuracy of the data that is entered into the system. The Chief Information Officer believes that quality and accuracy will be a by-product of the net-centric environment because the data will be widely visible to multiple people at multiple levels.[147]   This may be the case; however, data quality and accuracy should be monitored to ensure that users of this net-centric environment are accessing and using the best data available.

---

143 Net-Centric Data Strategy

144 Net-Centric Data Strategy

145 Walker, R. L., & Olney, D. S. (2004). Net-centricity has many moving parts. *Government Computer News, 23*(25). Retrieved October 21, 2005, from http://www.gcn.com/23_25/news/27085-1.html

146 Net-Centric Data Strategy

147 Net-Centric Data Strategy

5. Summary

BMMP has not yet included net-centricity of business systems as a requirement, but plans to include it in future versions of the BEA.[148] The introduction of modern business systems with greater capabilities is meaningless if these new systems cannot be effectively integrated with existing systems. Integrating the business data of DOD is necessary to provide decision makers with the most current, accurate, and reliable data available, so they can make the most informed, timely decisions.

F.   CHAPTER SUMMARY

Four key areas for future business systems modernization efforts were recognized through our case study research effort. The four areas involve improving change management, understanding the implications of using commercial off-the-shelf (COTS) products in business systems, structuring the acquisition in terms of well-defined, flexible requirements, and integrating new systems with existing legacy systems.

Strong leadership is necessary to overcome the massive resistance to change present in DOD in order to reap the benefits of business systems modernization. DOD and other federal agencies have been shaped by past experiences and traditions that help define their cultures. The more deeply rooted their traditions are, the more resistance to change the organization will display. Resisting change is a natural instinct. People typically embrace what they are comfortable with and resist the unknown. Implementation of change is accomplished by unfreezing the old system, moving towards a new direction and refreezing the new attitudes and behaviors. Change must be accomplished by a strong leader willing to champion the effort.

Even though DOD is mandated to use commercial items to the maximum extent practicable, COTS is not the answer in all situations. Proper use of COTS provides benefits such as high reliability, lower initial purchase costs, and vendor support services for the life of the product. The potential downsides of COTS include short product life

---

148 Business Management Modernization Program Website. *Homepage.* Retrieved October 20, 2005 from http://www.dod.mil/bmmp/faq_bea.html

cycles, early product releases that are rushed to market prematurely, and the lack of a 100 percent solution for most DOD business system needs. Our research identified seven best practices for COTS-based business systems. Modifications to COTS products should be highly discouraged since modified COTS lose many of the benefits related to commercial items and help foster a sole source environment for systems maintenance and support. Configuration management is paramount when using COTS. Systems must stay current by incorporating the latest upgrades in order to have continued vendor product support.

Proper planning for the entire acquisition process is essential for business systems modernization efforts. The process begins with well-defined requirements. Generating well-defined requirements occurs when the users are continually involved in the process. Requirements also need to match the available resources. These requirements should be flexible though to potentially allow for a COTS or commercial system solution. Tradeoffs between capabilities, system requirements, scheduling restraints, and cost restraints should be made throughout the system's life cycle.

System integration is crucial in all modernization efforts. DOD does not have the resources to scrap all legacy systems and start over from scratch. New systems must be effectively integrated with existing legacy systems in order for DOD to complete its mission. BMMP has addressed the need for integration through the Business Enterprise Architecture (BEA). The BEA defines business capabilities, rules, data standards, and operating requirements to improve the delivery of capabilities and resources to the warfighter.

THIS PAGE INTENTIONALLY LEFT BLANK

VI.   CONCLUSIONS

A.   SUMMARY

Our research has covered various issues relating to business systems modernization efforts within DOD. Chapter II established the legislative backdrop that set the stage for the Business Management Modernization Program (BMMP). Chapter III looked at the current state of DOD business systems and highlights some of the problems and concerns that need to be addressed by future business systems. Chapter IV is a collection of four case studies on DOD business systems in the areas of acquisition, contracting, financial management, and logistics. Two systems, the Standard Procurement System (SPS) and the Defense Logistics Agency Enterprise Resource Planning (ERP) system, were implemented prior to BMMP. The Defense Enterprise and Accounting Management System (DEAMS) and the Defense Acquisition Management Information Retrieval (DAMIR) system were released under the guidance of BMMP. Chapter V presents our analysis and recommendations for improving future business systems modernization efforts. Key findings include improving change management, understanding the implications of using commercial off-the-shelf (COTS) products in business systems, structuring the acquisition in terms of well-defined, flexible requirements, and integrating new systems with existing legacy systems.

B.   ANSWERS TO RESEARCH QUESTIONS

- **What areas can DOD focus on to further improve future business systems modernization efforts?**

The case studies on four DOD business systems deployed both before and after the implementation of the Business Management Modernization Program (BMMP) revealed four key areas that DOD can focus on to improve future business systems modernization efforts. The first area for improvement concerns change management. Business systems modernization involves changes in DOD business processes as well as changes in systems hardware and software. The second area of focus is the use of commercial off-the-shelf (COTS) products in DOD business systems. While COTS

products have many benefits associated with them, acquisition strategies must recognize the potential downsides of COTS use and only use this strategy when appropriate. The third area addresses the structure of the acquisition process. Establishing system requirements is the most critical phase of the acquisition process. Requirements must be well-defined, yet flexible due to the capabilities available in the marketplace and the amount of funding available for the program. The fourth improvement area is integration. No only does DOD need to modernize business systems, but they also need to successfully integrate these new systems with existing business systems.

- **What is the current state of DOD business systems?**

Chapter III covers the current state of DOD business systems. Legacy business systems suffer from increasing maintenance costs, making it difficult for DOD to invest in new systems versus maintaining existing systems. There is a general lack of standardization among business systems, resulting in duplicative processes and systems unable to "talk" to one another and share information. This leads to manual data inputs, increasing the likelihood of errors and inaccurate information. DOD is striving to correct these issues and has had some success with the Defense Finance and Accounting Service (DFAS) business systems initiatives.

- **What legislative acts instigated business systems reform?**

Chapter II discusses the evolution of business systems reform acts. The initial push for business systems modernization started with the Chief Financial Officers Act of 1990 (CFO Act). The CFO Act calls for auditable financial statements from the federal government. In order to comply with the CFO Act, financial systems must be upgraded, modernized, and have a higher level of standardization and integration. The Federal Financial Management Improvement Act of 1996 specifically addressed standardization and integration issues with financial systems. The Clinger-Cohen Act of 1996 allowed for better management of information technology (IT), resulting in better investment decisions for new business systems. The Business Management Modernization Program

(BMMP) was established in 2003 to provide oversight and establish guidelines for DOD business systems modernization efforts.

- **How successful has DOD been in previous business systems modernization efforts?**

Chapter IV covers two systems implemented prior to the establishment of the Business Management Modernization Program. The Standard Procurement System (SPS) was launched in 1996 as the first DOD-wide business system. SPS has incurred numerous schedule delays and implementation problems. Use of a heavily-modified commercial off-the-shelf (COTS) software package and a lack of well-defined system requirements have been the major sources of problems with the system. The Defense Logistics Agency (DLA) business systems modernization has been much more successful than SPS. DLA replaced two legacy systems with a web-based Enterprise Resource Planning (ERP) system. The new system is providing better inventory management, increasing responsiveness to customer needs while lowering overall costs through lower inventory holding costs and long-term supplier relationships.

- **What new systems have been fielded after the advent of the Business Management Modernization Program?**

Chapter IV describes two new systems fielded after the advent of the Business Management Modernization Program. The first program is the Defense Enterprise Accounting and Management System (DEAMS). This joint initiative between U.S. Transportation Command, the U.S. Air Force, and DFAS is designed to be an all-in-one, paperless system that will handle and distribute all relevant accounting data in electronic form. The second program is Defense Acquisition Management Information Retrieval (DAMIR). This program will provide the acquisition community management of Major Defense Acquisition Programs and Major Automated Information Systems through a unified web-based interface for information sharing. Both systems, while recently implemented, appear to have incorporated the lessons learned from previous, less successful programs.

C.   AREAS FOR FURTHER RESEARCH

- How has the broad definition of a commercial item in the Federal Acquisition Regulation (FAR) affected systems acquisition strategies?

- How can DOD do a better job in the area of change management?

- Will the nature of the commercial marketplace and increased reliance on commercial systems and services require a more responsive budgeting system than the current PPBES?

- Has BMMP made net-centricity a requirement for purchasing business systems and has it achieved the desired integration?

- What is the current status of DEAMS and DAMIR and have the systems achieved their goals?

LIST OF REFERENCES

Ackerman, R. K. (2004). Defense logistics modernizes commercially. [Electronic Version]. *Signal, 58*(5), 33. Retrieved September 1, 2005,

Acquisition Community Connection Website. *Defense acquisition management information retrieval system (DAMIRS).* Retrieved September 12, 2005 from https://acc.dau.mil/simplify/ev.php?ID=76069_201&ID2=DO_TOPIC

Alphabet Soup Webpage. *Homepage.* Retrieved September 12, 2005 from http://www.corpcomm-inc.com/january2005/alphasoup.htm

Athanasaw, D. L. (Winter 1998). Financial management reform--noble intentions, audit challenges. [Electronic Version]. *The Armed Forces Comptroller, 43*(1), 18. Retrieved August 30, 2005, from the ProQuest database.

Barchi, T. J. (1997). *Evaluation of best practices for developing and implementing integrated financial management system* (Special Evaluation Report No. OIG/97E-10). Washington, DC: U.S. Nuclear Regulatory Commission.

Builder, C. H. (1989). *The masks of war: American military styles in strategy and analysis*. Maryland: The Johns Hopkins University Press.

Business Management Modernization Program Website. *Homepage.* Retrieved August - November 2005 from http://www.dod.mil/bmmp

Cahlink, G. (2003). Standard procurement system. [Electronic Version]. *Government Executive, 35*(17), 76. Retrieved August 9, 2005, from the ProQuest database.

Carney, D., & Oberndorf, P. *The commandments of COTS: Still in search of the promised land*. Pittsburgh, PA: Carnegie Mellon Software Engineering Institute.

Carney, D., & Sledge, C. (1998). *Case study: Evaluating COTS products for DOD information systems*. Pittsburgh, PA: Carnegie Mellon Software Engineering Institute.

Chief Financial Officers Act of 1990, 31U.S.C. 205 (1990). Retrieved August 23, 2005, from http://irm.cit.nih.gov/itmra/cfoact.html

Consolidated Acquisition Reporting System Website. *CARS automated system overview.* Retrieved September 12, 2005 from http://www.acq.osd.mil/cars/

Defense Acquisition Guidebook Website. (2003). *Operation of the defense acquisition system* (No. DODI 5000.2)

Defense Acquisition Management Information Retrieval Website. *Homepage.* Retrieved September 12, 2005 from http://www.acq.osd.mil/damir/

Defense Enterprise Accounting and Management System (DEAMS). (2005). DEAMS software contract awarded to oracle. *DEAMS Current Account Newsletter*(August), September 27, 2005 from http://deams.transcom.mil/files/DEAMS_8_25_05.pdf

Defense Enterprise Accounting and Management System Website. *DEAMS 101 brief.* Retrieved August - November 2005 from http://deams.transcom.mil/?page=faq.deams

Defense Logistics Agency. (2003). Release two design phase kicks off. *The "One DLA" Connection, 9*, September 16, 2005 . Retrieved September 16, 2005, from http://www.eitoolkit.com/tools/change_management/16_cm_comm_newsltr_dla.ppt#257,1,Slide 1

Department of Defense. (2005). *Investment review process overview and concept of operations for investment review boards*. Washington, DC: Department of Defense.

Department of Defense Chief Information Officer. (2003). *Department of defense net-centric data strategy*. Washington, DC: Department of Defense.

Dorobek, C. J. (2002). Defense halts procurement system. [Electronic version]. *Federal Computer Week, 16*(4)

Gansler, J. (2000). *Commercial item acquisition: Considerations and lessons learned, USD (AT&L) memorandum*. Washington, DC: Department of Defense.

General Accounting Office. (2004). *Department of defense: Further action needed to establish and implement a framework for successful business transformation* (No. GAO-04-626T). Washington, DC: GAO.

General Accounting Office. (2004). *DOD business systems modernization: Billions continue to be invested with inadequate management oversight and accountability* (No. GAO-04-615). Washington, DC: GAO.

General Accounting Office. (2004). *Further actions needed to establish and implement a framework for successful financial and business management transformation* (No. GAO-04-551T). Washington, DC: GAO.

General Accounting Office. (2003). *Department of defense: Status of financial management weaknesses and progress toward reform* (No. GAO-03-931T). Washington, DC: GAO.

General Accounting Office. (2003). *DOD business systems modernization: Continued investment in key accounting systems needs to be justified* (No. GAO-03-465). Washington, DC: GAO.

General Accounting Office. (2003). *Improvements to enterprise architecture development and implementation efforts needed* (No. GAO-03-458). Washington, DC: GAO.

General Accounting Office. (2001). *DOD systems modernization: Continued investment in the standard procurement system has not been justified* (No. GAO-01-682). Washington, DC: GAO.

General Accounting Office. (2001). *Information technology: DLA should strengthen business systems modernization architecture and investment activities* (No. GAO-01-631). Washington, DC: GAO.

General Accounting Office. (2001). *Better matching of needs and resources will lead to better weapon system outcomes* (No. GAO-01-288). Washington, DC: GAO.

General Accounting Office. (1991). *The chief financial officers act: A mandate for federal financial management reform* (No. GAO/AFMD-12.19.4). Washington, DC: GAO.

Global Security Website. *Defense logistics agency.* Retrieved August 26, 2005 from http://www.globalsecurity.org/military/agency/dod/dla.htm

Goodenough, J., Pollak, B., & Sha, L. (2004). *Simplex architecture: Meeting the challenges of using COTS in high-reliability systems*. Pittsburgh, PA: Carnegie Mellon Software Engineering Institute.

Government Accountability Office. (2005). *DOD business transformation: Sustained leadership needed to address long-standing financial and business management problems* (No. GAO-05-723T). Washington, DC: GAO.

Government Accountability Office. (2005). *Long-standing weaknesses in enterprise architecture development need to be addressed* (No. GAO-05-702). Washington, DC: GAO.

Government Accountability Office. (2005). *DOD business systems modernization: Billions being invested without adequate oversight* (No. GAO-05-381). Washington, DC: GAO.

Government Accountability Office. (2004). *Information technology: DOD's acquisition policies and guidance need to incorporate additional best practices and controls* (No. GAO-04-722). Washington, DC: GAO.

Greenmeier, L. (2005). Defense agency updates systems. [Electronic Version]. *InformationWeek,* (1031), 51. Retrieved August 31, 2005, from the ProQuest database.

Hooper, J. (2002). *DLA fields first release of modernized system.* Retrieved August 31, 2005 from http://www.dla.mil/public_info/read_news.asp?track=145

Horizontal Fusion Website. *About net-centricity.* Retrieved October 14, 2005 from http://horizontalfusion.dtic.mil/about/net-c.html

Interoperability Clearinghouse Website. *Glossary of terms.* Retrieved October 20, 2005 from http://www.ichnet.org/glossary.htm

Joint Interoperability Test Command Website. (2005). *JITC OT&E defense logistics agency support.* Retrieved August 30, 2005 from http://jitc.fhu.disa.mil/ot&e/dla.htm

Kotter, J. P. (1996). *Leading change.* Boston, Massachusetts: Harvard School Press.

Lawlor, M. (2001). Military marches toward harmonized acquisition processes. [Electronic Version]. *Signal, 55*(10), 41. Retrieved August 9, 2005, from the ProQuest database.

Moore, J. (1997). AMS wins DOD-wide, $238M pact. *Federal Computer Week, 11*(10). Retrieved August 9, 2005, from http://www.fcw.com/article64655-04-13-97-Print

Moore, J. (1997). DOD inches toward $1B SPS contract. *Federal Computer Week, 11*(9). Retrieved August 9, 2005, from http://www.fcw.com/article64627-03-30-97-Print

O'Hare, S. M. (2005). *DEAMS, A project management perspective* (Term paper Winter 2005 at Naval Postgraduate School

Office of Management and Budget. *Circular A-12: Financial management systems.* Washington, DC: Office of Management and Budget.

Office of Management and Budget Chief Financial Officers Council. (2005). *Federal financial management report 2005.* Washington, DC: Office of Management and Budget. September 2, 2005,

Office of the Inspector General Department of Defense. (2001). *Development of the defense finance and accounting service corporate database and other financial management systems* No. D-2002-014). Washington, DC: Department of Defense.

89

Office of the Secretary of Defense. (2000). *Annual defense review 2000.* Washington, DC: Department of Defense.

Office of the Under Secretary of Defense for Acquisition Technology and Logistics Supply Chain Systems Transformation Website. *Portfolio management - acquistion domain policy drivers.* Retrieved August, 30, 2005 from http://www.acq.osd.mil/scst/policy_drivers.htm

Olney, D. S. (2005). Business transformation puts DLA in the know. [Electronic Version]. *Government Computer News, 24*(16)

Optimal Corporation. *Case study: Defense logistics agency.* Retrieved August 26, 2005 from http://www.optimalsol.com/C-CS-DLA.html

OSD Comptroller iCenter Website. *Change management, guiding organizations through transitions.* Retrieved October 10, 2005 from http://www.dod.mil/comptroller/icenter/learn/changeman.htm

Samson, J. Jr. (1999). *Building Dependable Systems using COTS* from http://www.crhs.uiuc.edu/FTCS-29/sampson.pdf Retrieved October 2005.

Senn, J. (2005). *DEAMS, A Joint USTRANSCOM, AF and DFAS Initiative Presented at the ASMC PDI 2005* from http://www.asmconline.org/development/pdi.shtml Retrieved October 2005.

Standard Procurement System Website. *Program overview.* Retrieved August 9, 2005 from http://www.spscoe.sps.eis.army.mil

Thomas, G. (1999). DOD's critical feeder systems: Achieving compliance with the federal financial management improvement act of 1996. [Electronic Version]. *The Armed Forces Comptroller, 44*(1), 15. Retrieved August 17, 2005 from the ProQuest database.

Tibbets, P. (2004). *BMMP Business Enterprise Architecture Version 2.2 Introduction and Walk-through* from http://www.dod.mil/comptroller/bmmp/products/bea_2-2_walk_thru/BEA2_2AMSession1Walk-Thru.pdf

Turk, W. (2005). Mission Possible…With good requirements. *Defense AT&L, XXXIV*(5), 20.

United States Air Force Scientific Advisory Board. (2000). *Ensuring successful implementation of commercial items in air force systems* No. SAB-TR-99-03). Washington, DC: USAF Scientific Advisory Board.

Verton, D. (1999). Report: Flawed acquisition strategy derails DOD's procurement system. *Federal Computer Week*. Retrieved August 9, 2005, from http://www.fcw.com/article69159-05-27-99-Print

Walker, D. (2005). *Comptroller General's remarks to the senate centrist coalition*. Washington, DC: GAO.

Walker, R. L. (2002). DOD expects industry to help it achieve net-centricity. *Government Computer News, 21*(29). Retrieved October 25, 2005, from http://www.gcn.com/21_29/news/20098-1.html

Walker, R. L., & Olney, D. S. (2004). Net-centricity has many moving parts. *Government Computer News, 23*(25). Retrieved October 21, 2005, from http://www.gcn.com/23_25/news/27085-1.html

Wright, C. (2005). Retrieval system would put procurement info on tap. *Government Computer News, 24*(17). Retrieved September 2, 2005, from http://www.gcn.com/24_17/defense-technology/36244-1.html

THIS PAGE INTENTIONALLY LEFT BLANK

INITIAL DISTRIBUTION LIST

1. Defense Technical Information Center
    Ft. Belvoir, Virginia

2. Dudley Knox Library
    Naval Postgraduate School
    Monterey, California

3. Richard L. Dawe
    Naval Postgraduate School
    Monterey, California

4. Lawrence R. Jones
    Naval Postgraduate School
    Monterey, California